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ABSTRACT

The special issue contains articles which focus on the opportunities for deaf high school graduates who want to go on to postsecondary education. Following an introduction by C. Williams is an interview with Gallaudet College's former Director of Admissions titled "Screening In--The Admissions Policy at Gallaudet College. An Interview with Bernard Greenberg" (which covers such issues as areas of screening) by B. Boston. "The Gallaudet Quality of Life Survey--Life Satisfaction Ratings of Gallaudet Alumni" by S. Anthony presents findings from 1,000 Ss in six main life areas: social participation; travel, recreation, and leisure; scholarly, intellectual, and artistic activities; life satisfaction ratings; anomie scores; and communication methods between respondents and parents. The case of a hearing impaired student nurse's enrollment in a nursing school program is reviewed by S. DuBow in "The Impact of Southeastern Community College v. Davis on the Rights of Deaf People." An article titled "College/Career Programs for Deaf Students--A Summary" (C. Williams) describes six programs with special services for deaf students. "The Long-Term Effects of Exchange Programs on Hearing and Hearing-Impaired Students" (S. Stein) reports a 10 year study of 99 students enrolled in special and exchange programs. "Postsecondary Transfer Opportunities for Hearing Impaired Students" is the topic of an article by J. Biser. Results of a study of 330 hearing impaired students are cited in "Influences on Academic Achievement of Hearing Impaired Students Born during the 1963-65 Rubella Epidemic" by T. Allen and M. Karchmer. A final article, "The 1963-65 Rubella Epidemic--Impacts on Postsecondary Education of a Large Population of Deaf Adolescents" (P. Kerstetter and D. Armstrong) reports findings on 1,949 hearing impaired students in terms of age at entry, sex distribution, additional handicapping conditions, and academic retention/progression. (SB)

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Issues in Postsecondary Education

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Purpose

Directions, a publication of Gallaudet College, provides professionals in the field of deafness with information important to the education and welfare of deaf people. *Directions* is a vehicle for disseminating innovative ideas, important papers, significant experience, and validated research findings, primarily originating on Kendall Green but interesting to the profession at large. It will update significant progress in academic studies, professional development, and research areas. The goals of the publication are to: (1) foster the continuing development of theory and practice, and (2) encourage extensive and thorough discussion of problems related to and drawn from such innovation.

Information for Authors

Each issue of *Directions* deals with a single topic identified as significant to the profession at large. *Directions* issues generally are planned by editors or guest editors many months in advance, and most of the articles are solicited from authors who have published original work on the topic. However, from time to time the journal solicits manuscripts on a particular topic from individuals outside the College community, either directly or through a call for papers. Manuscripts and editorial correspondence should be sent to Doin E. Hicks, Editor, *Directions*, Gallaudet College, Washington, D.C. 20002.

Manuscripts

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- quality of paper (white bond only; no colors; no erasable paper)
- margins (38 mm at top and on left; 25 mm on right, i.e. 1½" & 1")
- abstract (a summary of the article, under 200 words)
- acknowledgments (including author's current affiliation, supporting grants, etc.)
- pagination, headings, figures, tables, and references.

Policy

Manuscripts are reviewed on the basis of relevance of the article to the theme of the issue, acceptability of illustrations, accuracy in references, and completeness in content. Authors should make every effort to avoid the use of sexist terminology. Guidelines for the use of non-sexist language are available from the American Psychological Association, and from the National Council of Teachers of English (NCTE), 1111 Kenyon Road, Urbana, Illinois.

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Introduction

Clarence M. Williams

In recent years a number of sobering trends in postsecondary education have been noted in such sources as *The Chronicle of Higher Education* and *The College Board Review.* Some of the more prominent trends are (a) rapidly rising institution costs accompanied by higher costs of tuition and supplies (tuition and fees alone at private four-year colleges rose 115% between 1973 and 1981); (b) sharp decreases in Federal support for both institution programs and students; (c) an apparent lowering of standards for both admission and quality of academic work.

It is evident also that doubts about standardized testing programs are becoming widespread. This is accompanied by general questions as to the purposes of postsecondary education and its value in a mobile, career-minded populace where traditions appear to be changing constantly. In addition, and in seeming contrast to some of these ideas, there has been a recent increase in the numbers of foreign students in American colleges and universities. It has been estimated that the current enrollment of one million foreign students will triple by 1990.

The most comforting trend is a growing realization that *college*—in the traditional sense—is slowly but steadily shedding many of its restrictive structures. The concept of postsecondary education is undergoing a change in part because of a more general acceptance of continuing adult education. Industry now is providing education and training so that promising employees can perform their jobs better. These workers often receive the certificates and degrees which, in all probability, they would not otherwise obtain. Such business and industry-sponsored enrollments now exceed the number of on-campus students.

Needless to say, we see general postsecondary education and, in particular, policies and priority positions, in an almost steady-state of flux, but with some strong positions being taken. For example, the testing industry is taking a strong defensive stance in the face of numerous criticisms of admissions testing. The academic side of testing is also defensive in the face of theoretical and research-related questions that continue to pile up with regard to the testing of minorities for college acceptance. The burgeoning number of apparently foolish mistakes in test design, construction, analysis, and interpretation is another burden.

For the postsecondary education of deaf persons, we wonder, for example, if the general education model of the recruitment funnel is the same as shown in Figure 1. Questions such as the following crop up: Are the percentages through the process similar or different? If not, Why? and How? These and many other queries regarding Gallaudet's admissions process are addressed in this issue through the interview of Bernard Greenberg by education

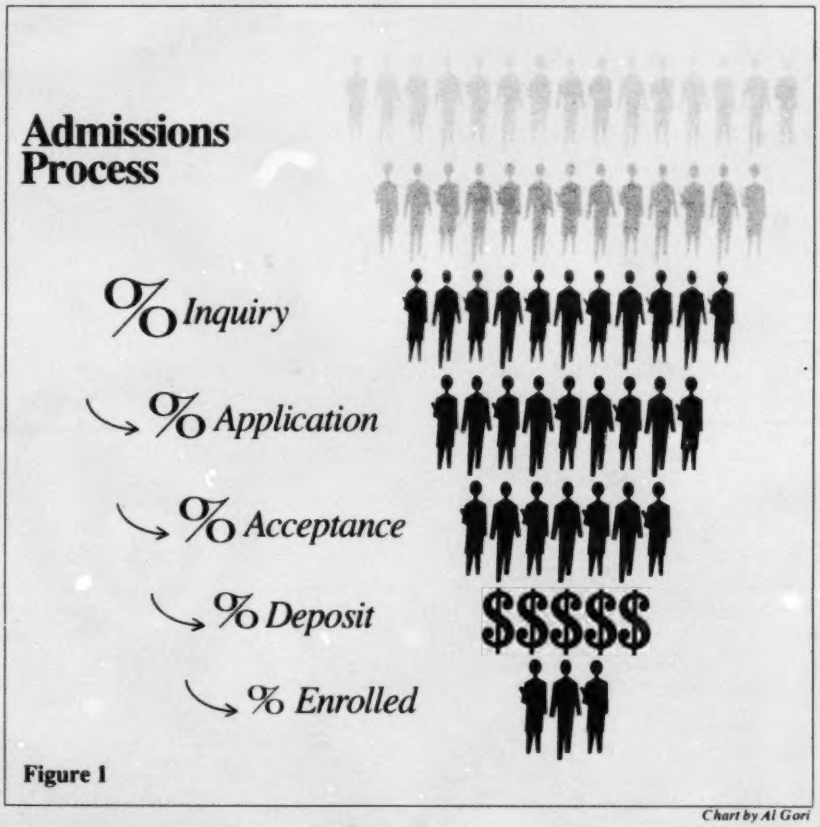

Figure 1

Chart by Al Gori

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writer Bruce Boston.

Gallaudet procedures are more comprehensive than most, and have been so for a number of years. Whereas Mr. Greenberg's program has been developed and continued over quite a number of years, it is comparatively recently that professionals in general education have begun systematically to develop and specify some of the important nonacademic admissions procedures. These include biographical data, interest inventories, recommendations, interviews, and personality measures, which are used to supplement test scores and other academic information.

Additional questions may occur about the retention rate in postsecondary programs. This year the College Board has completed a study which represents the first coordinated review of college student attrition and retention. By evaluating demographic, academic, motivational, personal, and environmental factors, a working profile of students most likely to drop out or persist has been developed. The study discusses questions such as the following:

- What is the current public attitude toward stopping out, dropping out, or not going to college at all?
- How important are extracurricular activities?
- Are frequently cited financial aid difficulties more imagined than real?
- Does distance from home have a bearing on retention?
- What is the significance of low grades?

Other areas touched on by the board are ensuring accuracy and completeness of catalog data, taking greater advantage of orientation, monitoring the quality of faculty student interaction, maintaining an alert counseling system, and strengthening career development programs.

A variety of opportunities appears to be available for deaf high school graduates who want to go on to postsecondary education. The possibilities range all the way from special institutions such as Gallaudet College and the National Technical Institute for the Deaf to the private four-year liberal arts colleges and major state universities.

Gallaudet in its 117 year history has awarded the vast majority of all undergraduate degrees attained by deaf persons. Deaf persons, however, have been successful in many colleges and universities with only a minimum of special services. For example, a study by personnel of the Central Institute for the Deaf (CID) in St. Louis has found that CID graduates have gone to over 100 different colleges and universities. The study points out the richness of former CID students' academic degrees and the trends to continuing education into graduate programs as evidence that indeed there is great breadth of opportunities for deaf adults.

It is our hope that this issue of *Directions* will answer many questions and perhaps stimulate new ones with which to deal in future exchanges of views with our readers.

Screening In: The Admissions Policy at Gallaudet College

An Interview with Bernard Greenberg

Bruce O. Boston

Editor's Note: On February 27, 1981, after 27 years of service to Gallaudet College—the last 17 as Director of Admissions—Mr. Bernard Greenberg retired. During his nearly three decades on the staff, Gallaudet expanded from a handful of buildings to a campus dotted with high rise dorms; the student body grew by 500%; and Gallaudet bloomed into a fully accredited, four-year liberal arts institution.

One of Mr. Greenberg's enduring contributions to the College, and indeed to the education of the hearing impaired across the country, has been the success he achieved in developing admissions policies and procedures fully responsive to the needs of hearing-impaired persons seeking higher education opportunities.

Recently, *Directions* invited education writer Bruce O. Boston to ask Mr. Greenberg for some of his reflections, particularly on the screening system he developed as part of Gallaudet's admissions program.

Directions: *Mr. Greenberg, what would you say is the biggest change you have seen in the postsecondary education of the hearing impaired since you came to Gallaudet?*

Bernard Greenberg: I don't know that I could point to a *single* change that I could characterize as the biggest or the most significant, but a couple of areas come to mind where I think tremendously important change has occurred.

The first is simply the sheer number of students we are now seeing at institutions of higher education. When I came here in 1954, there were only about 300 students; today there are over 1500. Over 27 years that amounts to an average increase of 18–20% per year. Most of that has been in recent years.

But as I look around, I see that this quantitative increase is not peculiar to Gallaudet. Today there are about 70 postsecondary programs for the hearing impaired around the country.[1] There has been an explosion in the area of the education of the handicapped, particularly since the passage of Public Law 94-142, and deaf education has been a part of that.

Another significant change, I think, has been in the *kind* of student now appearing in postsecondary institutions. When I first came here, the percentage of postlingually deaf far exceeded that of the prelingually deaf. Today, that situation has been reversed.

D: *What do you take that to mean? Why is that significant?*

BG: I think it reflects a massive attitudinal shift, not only in the field of education of the hearing impaired, but also in public attitudes about educating these people. There was a time, well within my memory, when prelingually deaf children were deemed by some to be virtually uneducable, except for learning what are today called *life skills*. They were certainly not considered college material. What gives me the greatest professional satisfaction is having been part of a movement that has continually worked to push back the boundaries of imagination and expectation.

Another thing that is important in this regard, I think, is the fact that Gallaudet has gained considerably on the national averages for liberal arts institutions in terms of admissions. In the late 1960s, about 50% of the hearing high school graduates in the United States went on to college, as compared to 6–7% of the deaf students. In 1979, some 61% of the hearing high school graduates went on to college, but about 35% of the deaf high school population went on to some postsecondary institution. About 10% of those students enrolled at Gallaudet.

D: *Do you see this trend continuing?*

BG: Yes, but let me qualify my answer. I think that through 1983 and 1984, when the rubella students are of college age, we will see a quickened pace of enrollment. Once we are past that point, the rate of increase will tend to moderate and flatten out, as it appears to be doing among the general high school population. I am certain of one thing, however. The clock on postsecondary education for the hearing impaired will never be turned back. We will never go back to the time when only an elite handful received an education.

D: *You were Director of Admissions at Gallaudet from 1964 to February 1981. How did the admissions picture change during that period? What policy changes occurred?*

BG: Well, again, one of the big changes was quantitative. Gallaudet still accepts about 50% of the students who apply, but while I was Director, enrollment about doubled. But that's not a policy change.

1. Rawlings, B. W., Trybus, R. J., & Biser, J. *A guide to college/career programs for deaf students* (Rev. ed.). Washington, D.C.: Gallaudet College; Rochester, N.Y.: National Technical Institute for the Deaf, 1981.

"We concluded that . . . we were going to have to create our own admissions tests. So we developed our own instruments."

D: *What is the admissions policy at Gallaudet?*

BG: Actually, it's fairly simple. We will admit any deaf applicant who shows evidence of having the academic ability and motivation needed to succeed at Gallaudet.

D: *I don't suppose that, as a general policy, that is much different from any other private, liberal arts institution. But among those who apply, you only accept half. How do you screen out the other half?*

BG: Now you have hit on what I think is distinctive, if not unique, about the admissions policy we have developed here. We don't try to screen people out. We try to screen them in.

D: *I am afraid the distinction escapes me. Could you elaborate?*

BG: Sure. One of my first tasks as Director of Admissions was to develop a set of screening devices to help us pick our students. Up until that time, the Registrar's Office handled admissions, and their decisions depended mostly on tests that were not designed for our special population. There was not a lot of hard evidence to use to make admissions decisions.

When we set out to design a new admissions procedure, we were faced with an immediate problem. We simply couldn't select students the same way other institutions did, i.e., relying heavily on the information generated by tests of performance, skill, and academic aptitude.

D: *Because the testing instruments were inappropriate?*

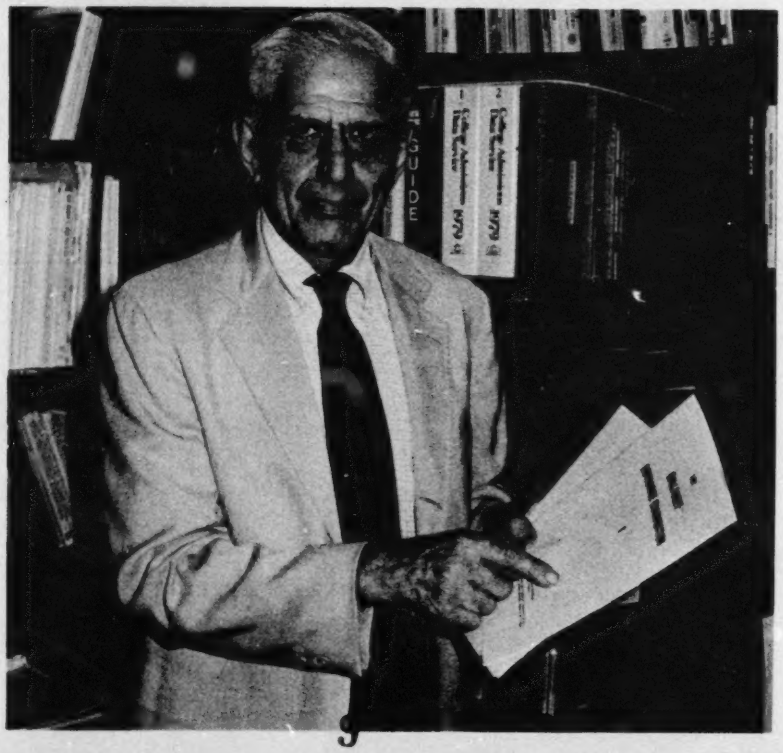
BG: Exactly. But beyond that, there is something even more fundamental, and that is that for most deaf students, performance on standardized instruments is a very poor indicator of aptitude. We had virtually no reliable way to discover what a deaf student's aptitudes were. We couldn't really find out, and by find out I mean predict with some degree of accuracy, whether an applicant would do well enough here to stay the course.

What we did know was what years of experience had taught us—that both skills and aptitude are necessary for a successful college experience. We knew we could educate individuals with depressed academic skills as long as they had potential. On the other hand, we also knew that aptitude in the absence of some usable skill level is only a recipe for failure. And we wanted to create success, not failure.

D: *So, what did you do?*

BG: After looking over some of the existing tests, and after reviewing them with our special needs in mind, we hit upon what I think was a pretty sound strategy. We concluded that, for the most part, we were going to have to create our own admissions tests. So we developed our own instruments. Some we adapted from other sources and some we made up ourselves. But everything we use now for screening has been normed on deaf students, and all the tests have been validated for use in predicting success at Gallaudet.

The short way of saying this is that instead of trying to expose areas of weakness, we went looking for strengths. Our present test battery offers applicants a wide variety of opportunities to demonstrate their strong points. It is a longer test battery than most colleges use, precisely for this reason.



"Students don't pass these tests. [They] are diagnostic instruments."

D: *What do you look for? What kinds of strengths?*

BG: We look for strengths in five areas of academic skill that have been determined to be related not only to academic success in general, but to success at Gallaudet in particular. These areas are (1) the ability to comprehend written material, (2) a knowledge of vocabulary, (3) the ability to construct sentences, (4) a knowledge of formal grammar, and (5) mathematical ability.

D: *How do you know when a student has passed the tests and can be admitted?*

BG: Students don't *pass* these tests. The tests are diagnostic instruments designed to reveal patterns of functioning in the five areas. Weaknesses in some areas may be compensated for by strengths in others. When we have doubts about a student's ability to function academically, we look more closely and begin to scrutinize things like academic motivation, as reported by secondary schools and counselors.

D: *Do you require applicants to have taken certain high school courses before they can be admitted?*

BG: No. The reason is that we have found that deficits in knowledge are comparatively easy to make up if the student's basic academic skills are adequate and if the aptitude is present. Along the same line, we attach very little importance to grades.

D: *Why is that? I would think that a deaf student who did well in high school, particularly in a regular class setting, would be likely to do well in college.*

BG: One might think so, but it's not that simple an equation. First of all, grades have very little value in predicting success among deaf applicants going into our liberal arts program. That's just a statistical fact. The reason is that our applicants come from an unbelievably wide variety of secondary schools and curricula. Add to this the fact that the standards used to grade them are terribly erratic, ranging all the way from strict competition with hearing students to charity grades. Then reflect on the fact that it's basically unfair to compare students who have gone to schools for the deaf with those who have not. All told, we find it's better to apply a common yardstick to all the applicants.

D: *I want to get back to that in a minute, but first I want to return to something that you said a minute ago that triggered a question in my mind. When you mentioned the five screening areas, I noticed that four of them related directy to the use of language and one to math. I also noted that none related to specific subject area knowledge, such as science or social studies. Why is that?*

BG: Let me answer the easy part first. We don't look at specific areas like history and biology for the same reason we don't look at grades. The amplitude of experience among applicants is just too great to be an accurate predictor of performance. We are concerned with a much more fundamental problem—can the student be successful at Gallaudet? Can he or she function in a postsecondary liberal arts program with the ability and potential that's there? The point is to find the ability and the potential and make a decision about it. Moreover, we have found that when subject matter tests have been given to deaf students, the tests really measure things like reading level and vocabulary, not subject matter knowledge.

As to why we concentrate so heavily on language, let me put it this way. Let's make an analogy. There are some fundamental similarities between deaf students and students who are economically and culturally deprived. The culturally deprived student can suffer many kinds of deprivation, including poor nutrition, inadequate health care, poorly educated parents, a bad family situation, and so on. It's a depressing litany that we all know too well. The deaf student, in addition to being handicapped, is also culturally deprived. The difference is that the deprivation in this case is language itself. Most deaf students, regardless of their family's socioeconomic status, start their education with a built-in *cultural deficit.* This is because they do not have access to *the* way to assimilate their culture—language. Deaf children cannot acquire language naturally, but must have it thrust upon them, so to speak. Even the concept of language must be learned.

Now, once the child goes to school, we know that (assuming equal teaching and innate intellect) learning rate is a function of previously accumulated knowledge and skills. A child who learns 95% of what he or she is supposed to learn in first grade brings a little less to second grade than the norm. By the end of second grade, the child may have learned only 90%. And so on, cumulatively, through the years. The cumulative building of this deficit is observable with a vengeance among deaf children. What starts out as a communication problem becomes, year by year, a formidable cultural deficit.

"For reading we use two tests. We administer the high school level of the Cooperative Test of Reading Comprehension to get speed and level scores."

From this starting point, we can go on to a couple of assumptions that are easily granted. One is that since deaf people are randomly distributed in the population, they are also normally distributed with respect to innate intellectual capacity. A substantial number of them can profit from higher education if we can determine a way to deliver it to them.

The second assumption is that the ability to do college level work depends primarily on intellectual capacity and skills, the chief skill being the ability to manipulate language. Thus, if we are going to provide a liberal arts education to deaf students, what we have to find out, above all else, is their ability to succeed in that education. When we can do that, we know how and where to get them started, what deficits we have to remedy, and what strengths we can build on.

D: *OK. Now back to the common yardstick. Could you describe, briefly, what the language tests test?*

BG: For *reading*, we use two tests. We administer the high school level of the Cooperative Test of Reading Comprehension to get speed and level scores. The second test is our own, based on expository sections from college texts. It is basically a sample test for a liberal arts curriculum.

We define *writing* as the ability to take ideas and put them into effective sentences. Again, we use our own test, in which an applicant is given three simple ideas and is required to write a correct sentence incorporating all three. A variety of relationships is included in the ideas presented, such as cause-effect, alternatives, temporal sequence, and the like. For *grammar*, we look primarily at usage, not mechanics. Here again, we use two tests, both Gallaudet constructed. The first is very conventional; it tests for standard bugbears like faulty reference, dangling participles, and subject-verb agreement. The second grammar test is more interesting. We refer to it as "deaf mistakes."

D: *What does that mean?*

BG: Like any linguistic subgroup, e.g., the Pennsylvania Dutch or the Chinese Americans, the deaf have characteristic locutions which do not conform to characteristic or *correct* English language patterns. These are not exactly grammatical errors, but rather nonstandard constructions. For example, deaf people often leave both definite and indefinite articles out of their speech and depend on the context to deliver the distinction between *a* book and *the* book. In this test, applicants are asked to determine whether a number of these locutions are correct or incorrect, and if incorrect, to choose the correct expression.

D: *What about vocabulary?*

BG: For *vocabulary* we use four different measures. The first is a long section on what might be called reading vocabulary. It essentially measures whether applicants can understand words they read. The second presents ideas in writing, and the applicants are asked to choose individual words that convey the meaning of the idea given in the test selection. The third measure tests knowledge of standard English idioms. Most people don't stop to think of the fact that most idioms are never taught as idioms, and they

" . . . we found hard evidence . . . that most standardized tests underestimate the potential of the deaf."

are never identified as such in writing. All language is idiom laden, both written and spoken, and it can quickly degenerate into gibberish for deaf people because their deprived language environment tends to avoid such expressions in favor of direct messages in which meanings tend to be more literal.

D: *Could you give me an example?*

BG: Sure. Suppose I say, "If I were hard put to it, I'd have a hard time putting my finger on his input as opposed to hers." Now, in that one sentence the word "put" is used in three different ways, *none* of which conforms to the basic English meaning of placing a thing in a specified position. In addition, you have the phrase "hard time" which makes no literal sense. How can "time" be "hard?" "Putting my finger on" is an idiom to convey the idea of "identify," but you learn that as a speaker and a hearer.

D: *OK! OK! I get the picture!*

BG: Another idiom! Where did you get the picture? Was it a photo, or a painting, or a movie?

D: *I surrender! You said there were four vocabulary tests.*

BG: Yes. The fourth is a test of inferential vocabulary in which applicants are asked to infer the meaning of a word they almost certainly do not know from the context in which it appears. We use this test to assess the applicants' skill in building vocabulary.

D: *Obviously the applicants will spread themselves out along a continuum of performance in taking these tests. Once you have the results of the screening, what happens?*

BG: The applicants are divided into six groups. In the highest group, Group 1, we place the applicants who are performing at or above the normal level for college bound students nationally in all five basic skill areas. That amounts to about 20% of the accepted applicants. In the next group are those performing at or above the normal level in four skill areas (usually the deficient area is math). This is about 5% of those accepted. Then comes the largest group, the 40% or so who make up Group 3. These applicants have what we call a *usable level* of skill in at least four areas. Applicants in Groups 1, 2, and 3 are granted admission, subject to demonstration of hearing loss.

In Group 4, where applicants have a usable level of skill in two or three areas (29% of those admitted), they may be admitted if they demonstrate any special skills or aptitudes on some of the tests in the battery not covered by the academic skill areas (e.g., science, abstract intelligence), or if they are highly motivated. Those in Groups 5 and 6 have a usable level of skill in one or none of the five areas; they constitute 5% and 1%, respectively, of those admitted. Students in Groups 3-6 are usually required to take remedial work before undertaking the regular college program.

D: *So the basic philosophy is not to establish a cut off line that says "you're in" or "you're out" that is based on test results. Instead, you try to bring in as many students as have a reasonable likelihood of success, and you arrange them according to what they can do and what they need in the way of remediation.*

BG: That's it. That's why we say we don't screen out, but screen in.

D: *It seems the screening program is fairly sophisticated.*

BG: We think it is, but I hasten to add that in many ways it was developed purely out of self-defense. We have always been in the position of needing assessment instruments that are more sensitive to people with all sorts of handicapping conditions. Section 504 of the Rehabilitation Act of 1973 prohibits discrimination on the basis of handicap. We started along this road long before Section 504 came into being, but we did it for many of the same reasons.

Once we began to develop our own procedures here at Gallaudet, we found hard evidence for what many educators had been saying for years out of gut instinct—that most standardized tests underestimate the potential of the deaf. We thought that if we could design instruments that had their needs in mind, instruments which would accurately reflect what they are capable of, then those students could benefit from access to higher education, and this would profit society in general. At Gallaudet we have always believed that; now I think we can prove it.

D: *Do you have any other evidence of the success of the screening program?*

BG: I think our graduates are the chief demonstration of the success of our selection procedures. We have taken a look recently at our graduates and it is most enlightening, and may I say, confirming. One of the most rewarding statistics is that 50% of Gallaudet's students eventually graduate, while only 45% of hearing students who enter college eventually graduate. So we are doing better than the national average there.

" . . . the admissions procedures we have devised, based on the idea of screening in rather than screening out, work pretty well. There is always room for improvement and fine tuning . . . but I believe we are on the right track."

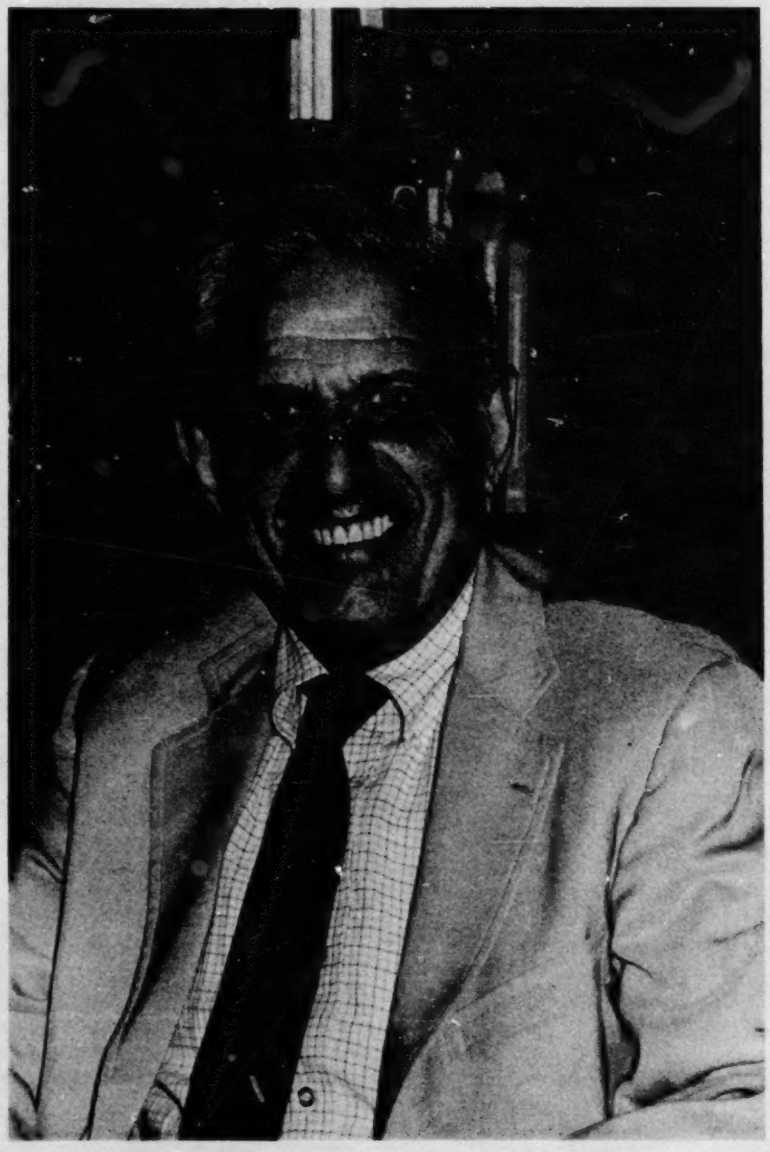
I can point to some other data generated by follow-up studies of Gallaudet graduates. We know that a higher proportion of Gallaudet graduates go on to obtain master's degrees than the normal percentage of college graduates. They also have a higher tendency to belong to professional, service, and fraternal organizations, and tend to be more satisfied with their home, hobbies, and health. One thing that I found absolutely astounding from a recent sample was that 20% of our graduates have published research. There can't be a dozen colleges or university undergraduate schools who can point to anything like that.

D: *All in all then. . . .*

BG: All in all, I'd say that the admissions procedures we have devised, based on the idea of screening in rather than screening out, work pretty well. There is always room for improvement and fine tuning, naturally, but I believe we are on the right track.

D: *What do you intend to do with your time, now that you're in retirement?*

BG: Well, if the consulting schedule I've been keeping is any indication, I am going to be doing no vegetating. Except maybe for Thursday afternoons. I figure I ought to devote some time to keeping up the appearance of retirement, even if the reality seems to be escaping me!



The Gallaudet Quality of Life Survey: Life Satisfaction Ratings of Gallaudet Alumni

Susan Anthony

Recently there has been renewed interest in social psychological studies on the quality of life (Campbell, 1976; Flanagan, 1978). Specifically, concern has focused on those qualities which contribute to high ratings of life satisfaction among Americans. Therefore, it is particularly fitting that research should address the issue of quality of life among specific segments of Americans. One of these segments is deaf Americans.

From previous research (Clemente & Sauer, 1976; Phillips, 1972; Bradburn, 1969; Bradburn & Caplovitz, 1965; Reissman, 1954) several consistent findings emerge: (a) there is a high positive correlation between perceived health and life satisfaction, (b) there is a high positive correlation between social participation and life satisfaction, (c) minority groups show less satisfaction than whites, and (d) there are no sex differences in life satisfaction. In addition, there has been a very small amount of research on the life satisfaction of handicapped persons (Cameron, Titus, Kostin, & Kostin, 1973; Cameron, Van Hoeck, Weiss, & Kostin, 1971; Gruhn & Krause, 1968). There is a consistency in these findings, namely that handicapped individuals were less suicidal, more religious, and more "other" oriented. Handicapped, as defined in these studies, included individuals with paralysis, blindness, deformity, missing limbs, or hearing impairment. There was a tendency for handicapped individuals to judge their lives as more difficult than the nonhandicapped. However, in terms of life satisfaction, there were no differences between the two samples.

Gallaudet Quality of Life Survey

The purpose of the present research is threefold: (1) to summarize the quality of life and participation of a sample of Gallaudet alumni, (2) to determine if any of these selected quality of life variables can predict life satisfaction for this sample, and (3) to compare the Gallaudet alumni's responses to those of a sample taken by the National Opinion Research Center (NORC). A special thanks must be given to NORC for providing detailed summaries of their 1977 survey.

Subjects

One thousand Gallaudet alumni who graduated between 1971 and 1975 served as subjects. The minimum age of the Gallaudet subjects was 24. This research is based on the 342 who returned the questionnaire.

Research Instrument

The Gallaudet Quality of Life Survey contained 40 questions which could be divided into 6 main life areas.

1. *Social Participation* – types of organizations to which the respondents belonged; religious participation; socializing with relatives, neighbors, non-neighbors; utilization of bars or taverns as part of the respondent's social life; and political involvement;
2. *Travel, Recreation, and Leisure*—countries visited, miles traveled; visits to historic sites, museums, ballets, mime performances, National Theatre of the Deaf, parks, and resorts;
3. *Scholarly, Intellectual, and Artistic Activities*—number of books read; number of magazines to which the respondents subscribed; magazines read by the respondents in the last year; library usage; and poems, papers, short stories, essays, paintings, ballets, etc., completed by the respondents in the last year;
4. *Life Satisfaction Ratings*—a total satisfaction score derived from satisfaction with family life, friendships, health, hobbies, and place of residence;
5. *Anomie Scores*;
6. *Communication Methods between Respondents and Parents*—methods used before coming to Gallaudet.

Procedure

Subjects answered the Gallaudet Quality of Life Survey and returned it by mail. No other contacts were made with these subjects.

Results: Part A

The first analysis involved tabulations of the various frequencies of attendance, participation, and communication modalities, as well as mean life satisfaction ratings and anomie scores for the Gallaudet sample. To facilitate comprehension, this data is presented in the six sections described earlier.

1. *Social Participation*
   a. Gallaudet graduates belong to a variety of organizations or clubs. The groups in which the respondents had memberships and the percentage involved in each group included fraternity and service groups (57%); school service groups (33%); professional or academic groups (32%); church affiliated groups (31%); and sports and teams (31%). About 15% of the respondents had membership in each of the following organizations – political groups, labor unions, hobby or garden clubs, literary groups.
   b. When asked to name the group in which they were most active, 31% mentioned fraternity and service groups.
   c. Regardless of the type of organization, the highest percentages of participation were in

"Since leaving Gallaudet, 3% to 25% of the respondents have written poems, professional papers, short stories, and/or essays; painted pictures; sculptured; acted or danced."

deaf and mixed (hearing and deaf) groups.

d. Approximately 60% of the respondents reported that they attended the group in which they were most active at least once a month.

e. On the average, the respondents belong to three organizations ($SD = 1.86$).

f. In terms of frequency of attendance at religious services, 60% said that they attended a few times a year, 22% claimed attendance of about once a month, and 18% attended once a week or more.

g. Fifty-nine percent of the respondents reported voting in the 1972 presidential election. However, only 5% were campaign workers during that election. Twenty percent have started some kind of civic petition, and 54% have signed a petition.

h. In rating their amount of socializing, the respondents used a 7 point scale. Zero equaled no participation at all and 6 indicated daily participation. Table 1 shows the mean participation scores.

2. *Travel, Recreation, and Leisure*
Respondents have been very active with respect to travel and visits to art museums and historical sites, and with respect to attendance at mime performances and theater. See Table 2 for the percentages reported.

3. *Scholarly, Intellectual, and Artistic Activities*

a. Forty-five percent of the respondents read 10 or more books in the past year. Forty percent have read at least 3 books. Only 5% reported reading no books in the last year.

b. Twenty-seven percent subscribe to more than five magazines and another 45% subscribe to 3–5 magazines.

c. The most popular magazines are *Readers' Digest*, the *Deaf American*, and *Newsweek*.

d. With respect to journals whose emphasis is deafness, 22% have read the *Volta Review* in the past year, 48% have read the *American Annals of the Deaf* in the past year, and 80% have read the *Deaf American* in the past year.

e. Seventy percent of the respondents have a library card and 52% go to a library at least once a month.

f. Since leaving Gallaudet, 3% to 25% of the respondents have written poems, professional papers, short stories, and/or essays; painted pictures; sculptured; acted or danced.

4. *Life Satisfaction*
The statistics in Table 3 indicate that Gallaudet graduates report being very satisfied with their lives. This is the case whether the composite life satisfaction rating or the specific areas of family, place of residence, friends, hobbies, and health are considered. For the composite life satisfaction score, a zero score would indicate no satisfaction and a score of 30 would indicate a great amount of satisfaction. For each specific area, again a score of zero would indicate no satisfaction and a score of six would indicate a great amount of satisfaction.

5. *Anomie*
The opposite of feeling satisfaction with life, home, family, etc., is feeling that one is not a part of society, that one is alienated. This feeling can be measured by an Anomie Scale (Srole, 1956). On this scale, the Gallaudet respondents scored an average of 4.2 ($SD = 2.2$). Since this scale runs from 0 which means no anomie to 9 which equals strong feelings of anomie, this sample of alumni tends not to have very strong feelings of anomie.

Table 1
Mean Social Participation Scores

Social Activities	$\bar{X}$	SD
Socializing with relatives	2.37	1.46
Socializing with neighbors	2.59	2.22
Socializing with non-neighbors	3.27	1.26
Going to bars	1.21	1.53

Table 2
Travel and Leisure Time Activities

Activity	Reported Participation
Visiting a city or town more than 1000 miles from home	56%
Traveling to a foreign country	52%
Visiting a large American city	97%
Visiting a national park	85%
Visiting an historical site	72%
Traveling to the seashore	78%
Visiting an art museum	54%
Visiting other museums	71%
Attending a mime performance	43%
Attending a performance of the National Theatre of the Deaf	59%
Attending a ballet	14%

"As would be predicted from previous research... the more social participation, the higher the life satisfaction ratings...."

Table 3
Satisfaction Scores of Gallaudet Alumni

Score	Mean	*SD*
Satisfaction with residence	4.39	1.45
Satisfaction with family life	4.78	1.69
Satisfaction with hobbies	4.75	1.51
Satisfaction with friendships	4.69	1.62
Satisfaction with health	4.99	1.47
Composite total life satisfaction	23.48	4.49

6. *Communication Methods between Respondents and Parents*
The communication methods used before coming to Gallaudet can be rank ordered. There were no significant differences in the percentages who used different communication methods. The most widely used method of communication between respondents and their parents was speech—64% reported using it. Approximately 14% used a combination of signs and fingerspelling. Eleven percent used speech, signs, and fingerspelling. The least popular method of communication was fingerspelling only (about 3%).

Results: Part B

Now that a brief picture of the Gallaudet graduates' life quality has been presented, it is necessary to consider the relationship of these various indicators to each other. In the survey, there were essentially two criterion variables—Total Satisfaction Ratings and Anomie Scores. One important question to consider was whether other variables, such as amount of traveling, social participation, and library usage, could predict the criteria. In order to consider this prediction question, the respondents' answers were re-formed into nine predictor and two criterion variables. (See Table 4.) The criterion variables were Total Life Satisfaction Ratings and Anomie Scores. The predictors were the number of groups to which the respondent belonged, the frequency of attendance at a favored group, religious attendance, social participation, political activity, traveling score, reading activity, library usage, and artistic activity.

As a preliminary step to understanding the relationships among these variables, an intercorrelation matrix was computed. In terms of the relationship between the criteria and the predictors, there were two significant correlations: a significant positive correlation between social participation and life satisfaction ($p = .001$), and a significant negative correlation between artistic activity and anomie. As would be predicted from previous research (1) the more social participation, the higher the life satisfaction ratings; and (2) the more artistic activity engaged in, the lower the anomie scores.

Within the predictor variables themselves, there were many significant correlations. Some of the most interesting of these relationships are listed below.

1. There were positive correlations between group membership and attendance at favored group, between group membership and social/political participation, between group membership and reading/artistic activity, and between group membership and political activity. Although correlation does not enable us to specify cause and effect, it does seem that the Gallaudet alumnus who belongs to many groups is also very active in these groups. Perhaps this could be called an *Activity Factor.*
2. There was a significant positive correlation between social participation and traveling, and between social participation and political activity. It seems that the Gallaudet alumnus who visits friends, neighbors, and family also travels and is interested in political happenings. Perhaps this could be called an *Involvement with People Factor.*
3. There were high positive correlations between political activity and reading activity, and between political activity and library usage. There were also high positive correlations between reading and artistic activity, and between artistic activity and library usage. Perhaps this is evidence for an *Intellectual/Artistic Factor.*

Two multiple regression analyses were computed. The first used total life satisfaction scores as the criterion, with the other nine variables as the predictors. The second used anomie scores as the criterion. In the first analysis, all the predictors could only account for 5% of the variance in the criterion. The best predictor, that is, the one that accounted for most of the variance, was Social Participation. However, since the amount of variance accounted for was so small, these results will not be discussed further. In the second analysis, all the predictors could only account for 7.5% of the variance in the criterion. The best predictor, that is, the one that accounted for most of the variance, was Artistic Activity. The more artistic things in which the respondent had interest, the lower his or her feelings of anomie. But, again, the amount of variance accounted for was too small to warrant further discussion.

Table 4

Statistics on the Gallaudet Quality of Life Survey
***n* = 342**

Variables	Range	Mean	*SD*
Number of groups to which respondent belongs (group membership)	0 to 12 0 = no groups 12 = 12 different groups	3.04	1.86
Frequency of attendance at favored group	1 to 5 1 = less than once a week 5 = about once a week	3.57	1.52
Religious Attendance	0 to 8 0 = never 8 = several times a week	3.24	2.61
Social Participation (visiting family, neighbors, non-neighbors, socializing at bars)	0 to 24 0 = never 24 = almost daily	9.34	3.42
Political Activity (voting in elections, signing a petition, starting a petition)	0 to 3 0 = never 3 = active in politics	.79	.86
Traveling Score (number of places traveled to in the past year)	0 to 9 0 = traveled nowhere 9 = 9 different places	5.66	2.15
Reading Activity	0 to 8 0 = no books or magazines 8 = more than 25 books/ magazines	5.15	1.89
Library Usage	0 to 4 0 = never 4 = once a week or more	1.89	1.38
Artistic Activity (number of different artistic activities undertaken)	0 to 12 0 = none 12 = 12 different activities	1.36	1.59
Total Life Satisfaction	0 to 30 0 = no satisfaction 30 = great deal of satisfaction	23.48	4.49
Anomie Score	0 to 9 0 = low in anomie 9 = high in anomie	4.28	2.18

Results: Part C

The next important step in trying to understand the quality of Gallaudet graduates' life is to compare it to data from other adults. As a first step, the NORC data (1977) on a sample of 1530 adults between the ages of 18 and 52 were used. This allowed valuable comparisons on the following variables:

1. Types of groups to which respondents belong;
2. Attendance at religious services;
3. Participation in the 1972 presidential election;
4. Choice of candidate in the 1972 election;
5. Socializing with relatives, with neighbors, and with non-neighbors; and socializing in bars or taverns;
6. Satisfaction ratings on place of residence, family life, friendships, hobbies, and health.

Before presenting the results of these comparisons, it should be noted that there is an *educational* difference between the Gallaudet sample and the NORC sample. All of the respondents in the Gallaudet sample were college graduates. The NORC respondents included 35% with less than a high school diploma, 48% with only a high school diploma, 2% with an AA degree, 9% with a bachelor's degree, 5% with graduate training. Although this comparison is helpful in understanding how Gallaudet graduates compare with a sample of the general public, it does not tell us how they compare with graduates from other colleges.

Comparison of Results from Gallaudet and NORC Samples

Types of Groups to Which Respondents Belong. In comparing the percentages of respondents who belonged to 10 types of groups, it can be seen readily that there were 4 sig-

"The Gallaudet sample had, in fact, higher ratings on three of the areas of life satisfaction than the NORC sample."

nificant differences ($p < .05$). (See Table 5.) Higher percentages of Gallaudet alumni belong to fraternity/service groups, to sport groups, to school service groups, and to professional/academic groups. The other groups showed no significant differences between the two samples.

Attendance at Religious Services. There was no significant difference between the mean frequency of religious attendance for the Gallaudet sample and for the NORC sample. The ratings varied from 0 (never) to 4 (very often). The mean frequency of attendance for the Gallaudet sample was 1.68, and it was 1.81 for the NORC sample.

Participation in the 1972 Presidential Election. There was no significant difference between the percentage of Gallaudet alumni (67%) and NORC respondents (59%) who voted in 1972. However, significantly more NORC respondents (59%) than Gallaudet respondents (34%) voted for Nixon. Significantly more Gallaudet respondents (48%) than NORC respondents (35%) voted for McGovern.

Social Participation. There were four significant differences between the samples (see Table 6). NORC respondents showed significantly more socializing with relatives and more socializing with their neighbors ($p < .001$). Gallaudet respondents showed significantly more socializing with non-neighbors ($p < .002$). NORC respondents showed significantly more frequenting of bars than the Gallaudet sample ($p < .001$).

Life Satisfaction. There were significant differences between the two samples on ratings of satisfaction with place of residence, with hobbies, and with health. (See Table 7.) Gallaudet respondents rated themselves as significantly more satisfied with their places of residence, with their hobbies, and with their health. There were no significant differences between the two samples' ratings of family life and friendships.

Discussion and Conclusions

This research supports earlier reports in which there was a high positive correlation between social participation and life satisfaction (Clemente & Sauer, 1976). It also underscores the findings of Cameron et al. on life satisfaction ratings among handicapped individuals. There were no differences between the Gallaudet sample and the non-handicapped (NORC) sample on two of these variables. The Gallaudet sample had, in fact, higher ratings on three of the areas of life satisfaction than the NORC sample. This certainly vitiates the myth that

Table 5

Percentages of Respondents Who Belonged to Various Groups*

Name of Group	NORC Sample	Gallaudet Sample
Fraternity/Service Groups	10%**	57%**
Political Groups	4%	15%
Labor Unions	16%	14%
Sport Groups	19%**	31%**
School Service Groups	13%**	33%**
Hobby or Garden Clubs	9%	15%
Farm Organizations	3%	2%
Literary/Art/Discussion Groups	9%	16%
Professional or Academic Groups	13%**	32%**
Church Affiliated Groups	37%	31%

Note. * These data were analyzed by Chi Square Statistics.
** Significant at or beyond the .05 level.

Table 6

Mean Ratings of Social Participation**

	NORC ($n = 1530$)		Gallaudet ($n = 342$)	
Social Participation Activity	$\bar{X}$	*SD*	$\bar{X}$	*SD*
Socializing with relatives	3.57*	1.61	2.37*	1.46
Socializing with neighbors	5.42*	2.03	2.59*	2.22
Socializing with non-neighbors	3.00*	1.61	3.27*	1.26
Going to bars or taverns	1.55*	1.88	1.21*	1.53

Note. * Significantly different at or beyond the .002 level.
** Range = 0 (never) to 6 (very frequently).

"This should lead future investigators to look for better, perhaps more diversified predictors."

Table 7

Mean Satisfaction Ratings

Life Area	NORC (n = 1530) $\bar{X}$	NORC (n = 1530) SD	Gallaudet (n = 342) $\bar{X}$	Gallaudet (n = 342) SD
Residence	4.05*	1.55	4.39*	1.45
Family Life	4.93	1.99	4.78	1.69
Hobbies	4.32*	1.46	4.75*	1.51
Friendship	4.75	1.98	4.69	1.62
Health	4.42*	1.63	4.99*	1.47

Note. * Significant at or beyond the .002 level.

a handicapped person must be less satisfied than his or her nonhandicapped counterpart.

The results with respect to social participation are not surprising. NORC respondents, because of few communication problems, find socializing with relatives and neighbors easier than the Gallaudet respondents. Consequently, there are significant differences between the two samples. However, it is necessary to emphasize the fact that the Gallaudet respondents were in the midrange of the participation scale, which certainly reflects an adequate amount of socializing with neighbors and friends. In addition, Gallaudet respondents were significantly higher in their socializing with nonneighbors. This may be due to their communication needs—deaf people tend to seek friends who can communicate in sign language. It was very encouraging to see both the variety of groups participated in and the amount of participation by Gallaudet respondents. However, these significant differences in favor of the Gallaudet alumni are to be expected since this sample is (or should be) more educated and aware by virtue of their additional schooling.

It should be noted that a substantial number of Gallaudet alumni contacted did not respond to the survey, therefore, those who did respond may not be representative of Gallaudet alumni. Respondents could, in fact, be considered to be volunteers, as they chose to return the questionnaires. From much of the social psychological literature on volunteers, it is known that they tend to be brighter, more in need of social approval, less authoritarian, and better adjusted than nonvolunteers. Thus, the Gallaudet sample may be biased in this regard.

It was disappointing that the regression analyses yielded so little. This should lead future investigators to look for better, perhaps more diversified predictors. Because so little research preceded this, it was necessary to take some liberties in terms of excluding variables that might be perceived as important, such as income, continued education, sex, marital status, and material well being. Flanagan (1978) found high percentages of American adults reporting their quality of life as good. He discusses the importance of delineating the specific factors responsible for that high assessment. One suggestion from his research involves using in-depth studies of individuals to identify the determiners of quality of life. Perhaps this approach, reminiscent of Crammatte's (1968) earlier approach, could be utilized in further studies using Gallaudet's alumni.

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The Impact of Southeastern Community College v. Davis on the Rights of Deaf People

Sy DuBow

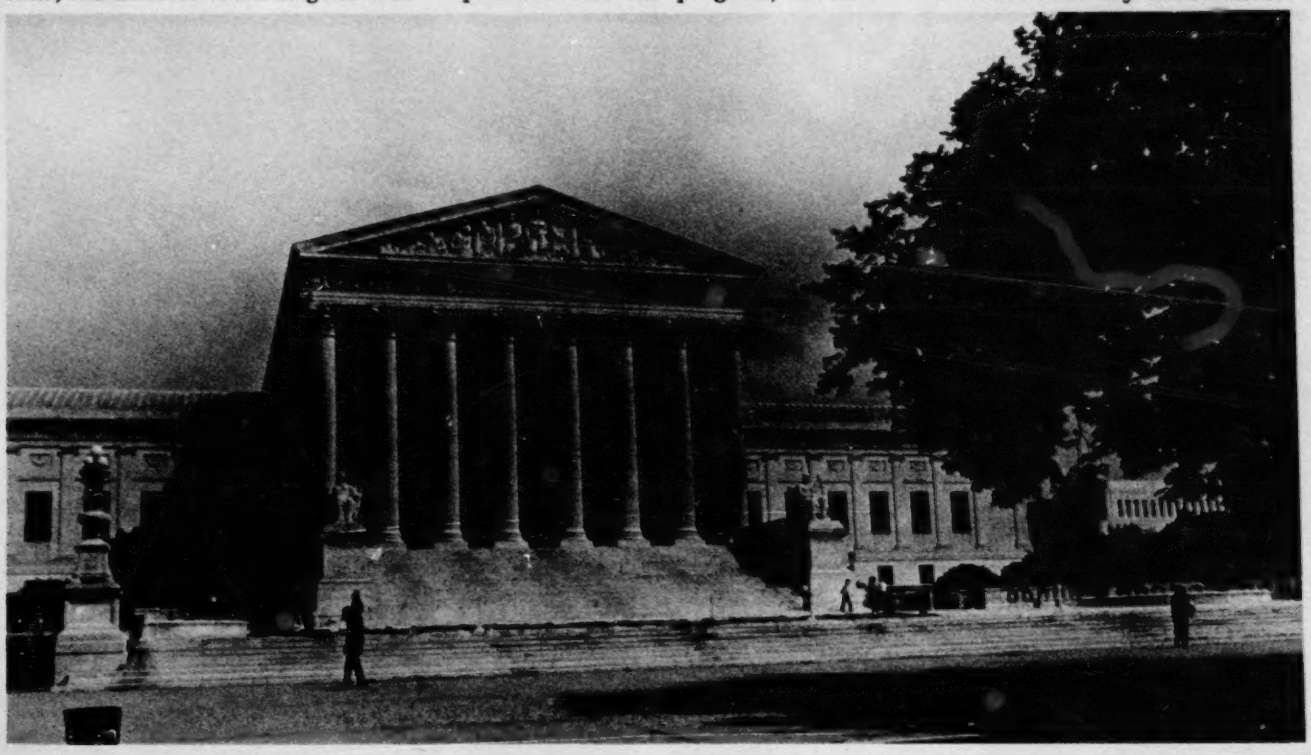
In *Southeastern Community College v. Davis*,[1] the Supreme Court ruled for the first time on the merits of a case brought under Section 504 of the Rehabilitation Act of 1973. Davis, a licensed practical nurse with a hearing impediment, sought to enroll in a nursing school program to become a registered nurse. The college requested her to submit to an evaluation by an audiologist, who found Davis to be an excellent lipreader when she could look directly at the speaker. The audiologist also recommended a new hearing aid to improve her hearing.

The college then consulted the Director of North Carolina's Board of Nursing, who thought Davis' hearing disability made it unsafe for her to practice as a nurse. At the same time, the director of nursing services at a nearby hospital, responding to an inquiry from the college, stated that she would employ Davis if there were a vacancy on the staff. She also said that she believed Davis could do well in areas like long-term care, or in a doctor's office, or an industrial setting. Nevertheless, the college rejected Davis' application because of her hearing loss.

The district court upheld the college's decision,[2] but the Fourth Circuit reversed it.[3] Relying on HEW regulations promulgated after the trial, the court ruled the college must reconsider the application without regard to Davis' hearing disability. The district court erred, the circuit court believed, because it considered the nature of Davis' handicap to determine whether she was "otherwise qualified" for the program, rather than limiting its inquiry to her "academic and technical qualifications," which is the new HEW standard. Further, the court instructed the lower court to consider on remand to what extent HEW regulations required the college to modify its program to accommodate Davis' disability.

A unanimous Supreme Court reversed the circuit court's decision, finding no violation of Section 504. The Court held

> Nothing in the language or history of § 504 reflects an intention to limit the freedom of an educational institution to require reasonable physical qualifications for admission to a clinical training program. Nor has there been any showing in this case that any action short



" . . . the Supreme Court has avoided deciding whether Section 504 requires a college or university to spend its own funds to accommodate the needs of a handicapped person."

of a substantial change in Southeastern's program would render unreasonable the qualifications it imposed.[4]

Justice Powell, writing for the Court, also found that Section 504 does not compel schools "to make *substantial* modifications in their programs to allow disabled persons to participate." [5] Instead, the Court interpreted Section 504 to mean "that mere possession of a handicap is not a permissible ground for assuming an inability to function in a particular context." [6]

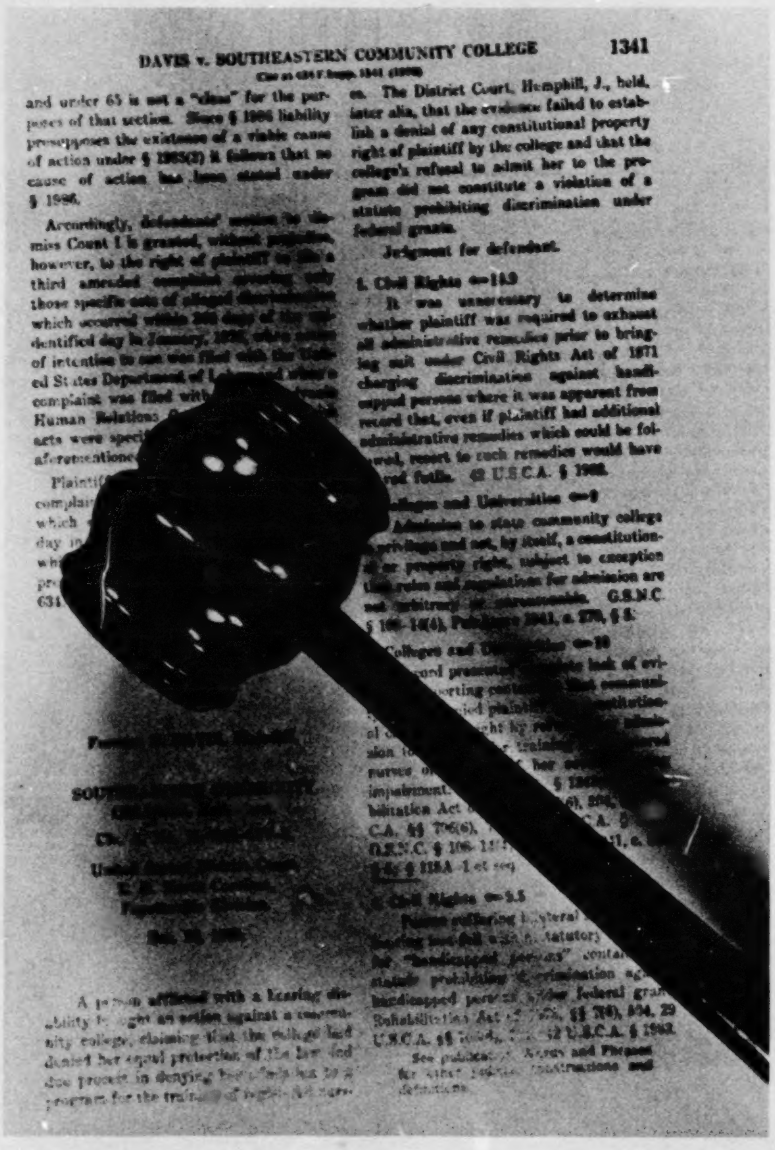
The Court thus found that an otherwise handicapped person under Section 504 is "one who is able to meet all of a program's requirements *in spite of his handicap.*" [7]

Davis was unable to meet those requirements since "the ability to understand speech without reliance on lipreading is necessary for patient safety during the clinical phase of the program." [8] The Court stated that on the record it was unlikely she could successfully participate in the clinical program with any of the accommodations the regulations require. The Court concluded that close individual supervision or changing the curriculum to limit her participation to academic classes was "far more than the 'modification' the regulation requires." [9]

The Court noted that situations might arise where perpetuation of requirements could arbitrarily deny qualified disabled persons a chance to participate in a program. Advances in technology can increase opportunities for handicapped persons to be qualified without putting an undue burden on the state.

Thus, situations may arise where a refusal to modify an existing program might become unreasonable and discriminatory. Identification of those instances where a refusal to accommodate the needs of a disabled person amounts to discrimination against the handicapped continues to be an important responsibility of HEW.[10]

Since the *Davis* decision, the Supreme Court has avoided deciding whether Section 504 requires a college or university to spend its own funds to accommodate the needs of a handicapped person. The Justices reviewed a case in 1981 involving a


DAVIS v. SOUTHEASTERN COMMUNITY COLLEGE 1341

and under 65 is not a "class" for the purposes of that section. Since § 1986 liability presupposes the existence of a viable cause of action under § 1985(3) it follows that no cause of action has been stated under § 1986.

Accordingly, defendants' motion to dismiss Count I is granted, without prejudice, however, to the right of plaintiff to file a third amended complaint asserting only those specific acts of alleged discrimination which occurred within 300 days of the identified day in January, 1976, when notice of intention to sue was filed with the United States Department of Labor and when a complaint was filed with the Human Relations

The District Court, Hemphill, J., held, inter alia, that the evidence failed to establish a denial of any constitutional property right of plaintiff by the college and that the college's refusal to admit her to the program did not constitute a violation of a statute prohibiting discrimination under federal grants.

Judgment for defendant.

1. Civil Rights ⇐149

It was unnecessary to determine whether plaintiff was required to exhaust all administrative remedies prior to bringing suit under Civil Rights Act of 1871 charging discrimination against handicapped persons where it was apparent from record that, even if plaintiff had additional administrative remedies which could be followed, resort to such remedies would have proved futile. 42 U.S.C.A. § 1983.

Colleges and Universities ⇐9

Admission to state community college is privilege and not, by itself, a constitutional or property right, subject to exception that rules and regulations for admission are not arbitrary or unreasonable. G.S.N.C. § 115-143(4).

Colleges and Universities ⇐10

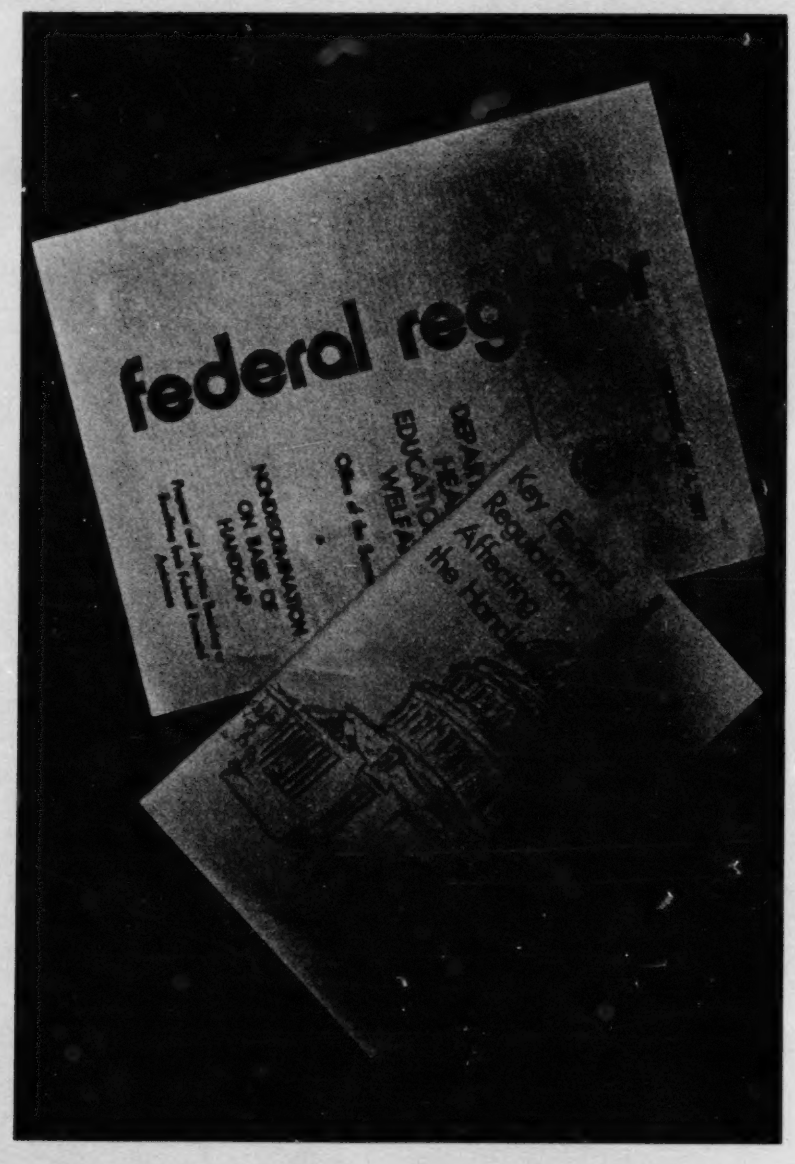
Civil Rights ⇐9.5

Person suffering bilateral hearing loss fell within statutory definition of "handicapped persons" entitled to statute prohibiting discrimination against handicapped persons under federal grant. Rehabilitation Act of 1973, §§ 706(6), 504, 29 U.S.C.A. §§ 706(6), 794; 42 U.S.C.A. § 1983.

See publication Words and Phrases for other judicial constructions and definitions.

" . . . Walter Camenisch, a deaf student, asked the university to pay for interpreting services as required by . . . Section 504."

deaf student requesting interpreter services at the University of Texas, but did not decide the merits of the case. The case originated when Walter Camenisch, a deaf student, asked the university to pay for interpreting services as required by the Department of Education Regulation to Section 504. Camenisch, a graduate student who was not a client of vocational rehabilitation, needed a course to fulfill the promotion requirements for his job at the Texas School for the Deaf. If he failed to complete the course, he would lose his job. The university maintained that Mr. Camenisch did not meet the university's criteria for financial assistance to graduate students and therefore refused to provide him with an interpreter.



The university agreed that Mr. Camenisch was a qualified handicapped student who met all of its legitimate requirements for admission. It was also agreed by both parties that Mr. Camenisch needed an interpreter to participate and benefit from the classes.

Lower federal courts ordered the University of Texas, which received more than 31 million dollars in federal aid at the Austin campus, to provide an interpreter temporarily, pending a final ruling on whether the university had a legal duty to provide an interpreter under Section 504.

The Supreme Court found the case as presented moot since the student had graduated, making the temporary order lose its legal meaning. The Court sent the case back to the district court for a trial on the issue of whether the university or the student was obliged to cover the costs of the interpreter.[11]

Since the *Davis* decision, two federal district courts have decided that State Vocational Rehabilitation agencies must pay for interpreters for deaf college students who are vocational rehabilitation clients. A New Jersey district judge found a legal duty on VR to pay for interpreters in Title I of the Rehabilitation Act,[12] while an Illinois district court judge held that when a student is a VR client, the state VR agency has primary responsibility under Section 504 to pay for interpreter services for the student's classes.[13]

"... lower federal court opinions involving hearing-impaired people show that Section 504 still has vitality for qualified handicapped people."

Ruth Ann Schornstein is a deaf VR client who attends Kean College in New Jersey. She plans to earn a college degree in social work/psychology. The New Jersey Division of Vocational Rehabilitation Services (state agency) accepted Ms. Schornstein as an eligible VR client and developed an individual rehabilitation plan to meet her vocational goal. Although the state agency provided tuition and books, they refused to provide interpreter services. All groups involved agreed that she needs an interpreter to participate effectively in her classes. The Court later found that without the interpreter, these other benefits would be useless.

The National Association of the Deaf Legal Defense Fund (NAD-LDF) filed a lawsuit against both the state agency and Kean College. The federal court held that the state agency's policy denying interpreter services to every deaf college student violates Title I of the Rehabilitation Act. Title I requires state VR agencies to provide certain rehabilitation services, including interpreters, to accepted VR clients. The Court held that the state agency policy "completely contradicts the Act's requirements which ensure individualization of programs for handicapped individuals."

The state agency argued that it had discretion on what services to provide. The Court was not persuaded. The Court found that the Rehabilitation Act specifically requires VR agencies to (a) first serve severely handicapped individuals, which include deaf people, and (b) provide those services listed in the Rehabilitation Act which are necessary to assist the handicapped person to achieve his or her vocational goal.

Because the state agency accepted Ms. Schornstein as a client and also agreed that she requires interpreter services to meet her vocational goals, the Court concluded the agency is legally obligated to provide those services. Since the Court decided the case solely on the basis of Title I, it did not find it necessary to rule on the obligation to provide interpreters under Section 504 or the U.S. Constitution.

This case helps clarify the responsibility of VR agencies to provide interpreters to deaf VR clients attending college.

In the Illinois case, a deaf student majoring in mechanical engineering at the Illinois Institute of Technology (IIT) in Chicago, Illinois, needed an interpreter in order to understand and participate in his classes, which began in August of 1979. Although he was an eligible VR client, receiving tuition, room and board, and books from the Illinois Division of Rehabilitation Services, the VR agency refused to provide him with interpreters. He was also refused these interpreter services by the college.

The court stated that when a student is a VR client, the state VR agency has primary responsibility under Section 504 to pay for interpreter services for the student's classes. The court went on to say that if the student is not a VR client, and no other sources are available, then the college has the ultimate responsibility to pay for interpreter services.

The Illinois VR agency tried to persuade the court that it was prohibited from providing interpreters to the student under Title I, if other "similar benefit" programs or community resources were available to pay for these services. The VR agency claimed that since the college had a legal obligation under Section 504 to provide interpreters to deaf students, the college was a "similar benefit" program or community resource, and, therefore, VR did not have to pay for interpreters.

The Illinois Rehabilitation Agency has appealed this decision.

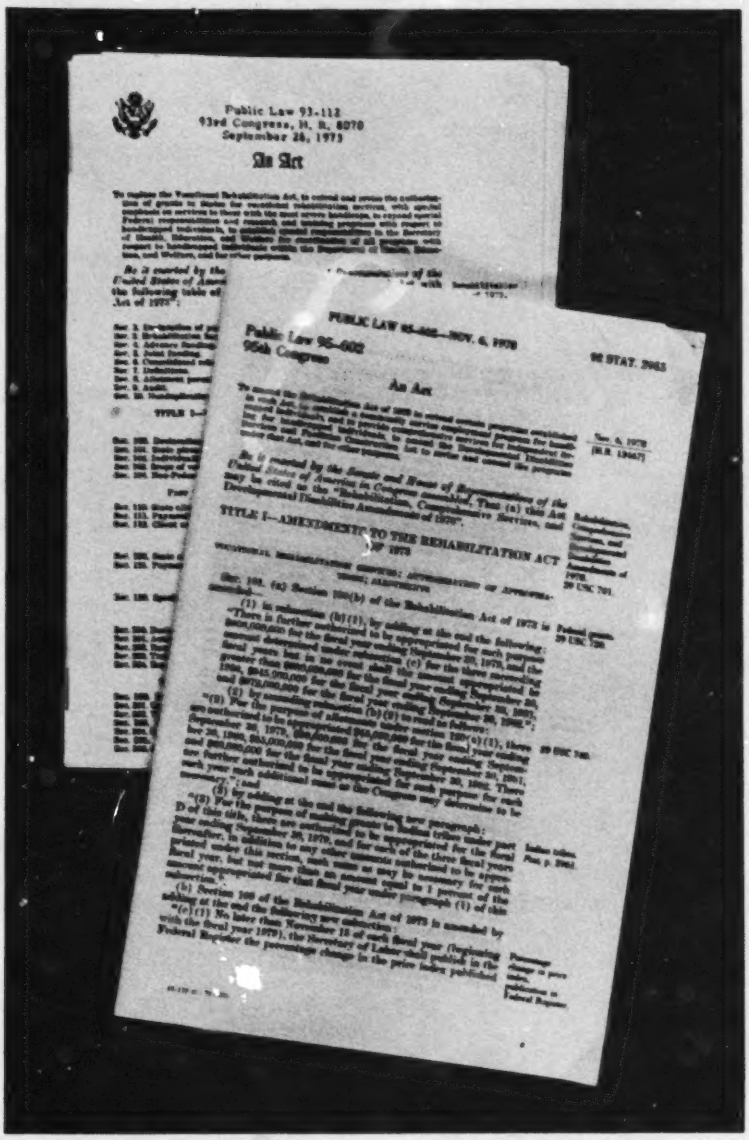
In yet another case, a recent federal appellate court ruled that Section 504 was the main legal support for requiring that public television stations take immediate steps to enable hearing-impaired people to enjoy programs. The U.S. Court of Appeals for the District of Columbia ruled that the Federal Communications Commission (FCC) must quickly require public television stations to serve hearing-impaired people.[14] The Court ordered the FCC to hold a public hearing before acting on the license renewal of a Los Angeles public television station, KCET-TV.

Conclusion

Since the *Davis* decision, lower federal court opinions involving hearing-impaired people show that Section 504 still has vitality for qualified handicapped people. The amount of accommodation required under Section 504 will depend, however, on how substantial a burden will fall on the recipient of federal funds. The specific requirements of Section 504 are spelled out in agency regulations. The present administration's efforts to review and weaken these regulations may make future court battles under Section 504 more difficult for disabled people. Court challenges will have a better chance of success for disabled people if they rely on specific statutory language requiring enumerated services as in Title I of the Rehabilitation Act and the Education for All Handicapped Children Act (PL 94-142).

Reference Notes

1. 422 U.S. 397 (1979)
2. 424 F. Supp. 1341 (D.N.C. 1976)
3. 574 F.2d 158 (4th Cir. 1978)
4. 422 U.S. at 414.
5. *Id.* at 405.
6. *Id.*
7. *Id.* at 406 (emphasis added).
8. *Id.* at 407.
9. *Id.* at 410.
10. *Id.* at 412-413.
11. *University of Texas v. Camenisch* 101 S. Ct. 1830 (1981)
12. *Schornstein v. The New Jersey Division of Vocational Rehabilitation Services*, 519 F. Supp. (1981)
13. *Jones v. Illinois Department of Rehabilitation Services*, 504 F. Supp. 1244 (1981)
14. *Gottfried v. Federal Communications Commission*, No. 79-1722 (D.C. Cir., April 17, 1981)


Public Law 93-112
93rd Congress, H. R. 8070
September 26, 1973

An Act

PUBLIC LAW 95-602—NOV. 6, 1978
Public Law 95-602
95th Congress
92 STAT. 2955

An Act

TITLE I—AMENDMENTS TO THE REHABILITATION ACT OF 1973

College/Career Programs for Deaf Students: A Summary

Clarence M. Williams

After completing high school, deaf students have educational opportunities both in liberal arts studies for professional careers and in vocational technical programs. Six postsecondary programs for deaf students have been established at higher education facilities located throughout the United States. These six programs receive federal support. These and 51 other postsecondary facilities are described in *A Guide to College/Career Programs for Deaf Students, 1981 Edition* (Rawlings et al., 1981).

The federally established programs are Gallaudet College, Washington, D.C.; California State University at Northridge, California; National Technical Institute for the Deaf, Rochester, New York; St. Paul Technical Vocational Institute, St. Paul, Minnesota; Seattle Central Community College, Seattle, Washington; and Delgado Community College, New Orleans, Louisiana. For most students, attending these postsecondary institutions requires staying on or near the campus. The schools either provide dormitory living on campus or have a housing office that can assist the students in finding appropriate living accommodations close to campus.

Special services are provided for the deaf students in these colleges and career programs. Interpreting services are offered for classes in which deaf students enroll. Tutoring and notetaking services also are available on request. Students should be aware that staff members are there to help them in reaching their educational goals. Knowing that special services exist, students can request those most useful for mastering their chosen classes.

The Liberal Arts College

Gallaudet College, Washington, D.C.
(Liberal Arts, Graduate)

California State University at Northridge, Northridge, California
(Liberal Arts, Graduate)

The liberal arts college provides students with a wide choice of major fields. Courses are offered in English, languages, mathematics, sciences, the arts, economics, education, commerce, home economics, journalism, and other areas during the four-year program of studies. During the first two years the student is required to take a general program that includes courses in English, math, science, and other basic areas. This familiarizes them with the types of specialized programs available for their remaining two years.

Students can live in a campus dormitory in either private or double rooms. Cafeteria services are in the dorm or close by. With these needs taken care of, students have time to study, to go to the library, to participate in campus activities (ranging from sports teams to the campus newspaper), and to get acquainted with fellow students and members of the college staff.

At some point during the first two years of the program, the student selects a major field of study. On completing undergraduate education, the student receives a bachelor's degree and goes on to enter a chosen profession or to study further by taking a graduate program in his or her field. Gallaudet and CSU at Northridge also offer programs of graduate studies.

The Vocational Technical School

National Technical Institute for the Deaf (NTID), Rochester, New York
(Technical, Professional, Graduate)

St. Paul Technical Vocational Institute, St. Paul, Minnesota
(Vocational, Technical)

The major purpose of the vocational technical school is to prepare students for a specific career. For instance, the entering student is given a preparatory program to examine educational opportunities and to review the language, math, and science skills that will be needed for various programs offered.

After choosing a career direction, the student begins career training with courses designed to develop knowledge and skills needed for his or her chosen profession. Career counseling is available to help students in making their career choices.

Career training programs are available which prepare individuals to be accountants, data processors, engineering technologists for architecture, civil, and industrial applications, optical finishers, medical technologists for laboratory and records areas, photographers, printers, and media technicians, among others. Both the St. Paul Technical Vocational Institute and the National Technical Institute for the Deaf offer these programs. In addition, NTID offers baccalaureate programs in the arts, business, engineering, communications, and medical fields; and graduate programs in many professions.

Students enrolled in one of these programs receive intensive technical training designed to allow them to find employment in their chosen fields. During the two to four years of study, students are encouraged to interact with the staff and with each other. The fellow students will eventually be fellow trade members. With student housing available on or near campus, the campus itself can be the center for student life.

The Community College

Delgado Community College, New Orleans, Louisiana

"The student . . . can pick a course of study to prepare for direct entry into a career . . . . "

(Vocational, Technical, Liberal Arts, Transfer)

Seattle Central Community College, Seattle, Washington

(Vocational, Technical, Liberal Arts, Transfer)

The community college offers a two-year postsecondary program which can prepare the student for a career or for continued study at a liberal arts college or technical vocational school.

To pursue a liberal arts education at a community college, the student takes courses similar to the ones offered in the four-year liberal arts college. If he or she needs remedial work, the community college may be the best choice, as many of the courses address those needs. Upon completing the two-year course requirements, the student is ready to transfer to a liberal arts college to complete the four-year program in a major field of study.

The student who enters a vocational or technical program can pick a course of study to prepare for direct entry into a career on completion of the program. Also, a field which is quite technical can be studied with the plan to continue studies at one of the vocational technical schools.

Two-year courses of study which lead to a career include secretarial/clerical, business, data processing, cabinet making, food technology, interior design, and machining, plumbing, and welding technology.

Courses in liberal arts are similar to those described for the liberal arts colleges, and courses for fields of higher technology include preparatory work and in-the-field courses. These count as credit courses when applied to the program at the four-year college or technical school.

The community colleges will provide supervised housing either on or off campus; however, many of the students enrolled in a community college live in the area of the college. The demand for housing is, therefore, limited. The level of campus activities may be less than at the four-year college, but there are opportunities to participate in projects and social activities held on the campus or in the community.

The Cost of Postsecondary Education

In contrast to the K–12 public schools which are free, postsecondary schools must charge tuition. To plan financially for schooling, the student must consider these costs. Tuition costs vary considerably among the six institutions. Gallaudet and NTID charge $729/year. The state and community colleges have noticeably different fees for their in-state and out-of-state students. For example, a New York resident attending a New York school may pay $384/year, while an out-of-state student may pay $2392/year.

A second high cost is that of living expenses. Room and board rates in dormitories vary between $1300 and $2200 per year. Additional expenses include the costs of books and supplies, clothing, and miscellaneous items.

Ways of covering these expenses can range from full parental support to partial assistance. The student

can work summers and part time while attending school. There are grants, scholarships, and government subsidized loans which cover or delay the costs of training until the student is in a capacity to pay back the loan. The financial aid officer at the college or institute and the college/career counselor at the high school should be able to supply the student with information regarding these matters.

Reference

Rawlings, B. W., Trybus, R. J., & Biser, J. *A guide to college/career programs for deaf students* (Rev. ed.). Washington, D.C.: Gallaudet College; Rochester, N.Y.: National Technical Institute for the Deaf, 1981.

The Long-term Effects of Exchange Programs on Hearing and Hearing-Impaired Students

Shirley P. Stein

This study represents an inquiry into student attitudes, objectives, career choice influences, and long-term effects of deaf-hearing contacts. The total study being reported deals with three distinct populations in three different circumstances.

1. Undergraduate hearing students who spent one or two semesters at Gallaudet as special or exchange students from hearing colleges.
2. Undergraduate hearing-impaired Gallaudet students who spent one semester as exchange students at either Oberlin College or Western Maryland College (the two colleges with which Gallaudet has formal exchange programs).
3. Undergraduate hearing students at Oberlin College who elected to enroll in an intensive one-month winter term course entitled Orientation to Deafness and Introduction to Manual Communication.

Three separate questionnaires were devised—one for each of the specified populations. All the participants were queried concerning their attitudes, their experiences and interactions, communication, objectives in participating in any one or two of the three programs, and the positive and negative effects of these contacts.

The data derived from the questionnaires will be analyzed, discussed, and summarized separately.

Background

This survey primarily involved students enrolled in special and exchange programs from 1972 to 1980. It also included hearing undergraduate students who were enrolled in some other college in the United States, but who had spent time at Gallaudet prior to 1972. Two students who attended Gallaudet during 1970-71 and five who attended during 1971-72 are included in this group. Partially as a result of the interest of two of the Oberlin College students, a structured arrangement for special and exchange students to come to Gallaudet was initiated in 1972.

Oberlin College has a month-long winter term minimester during which students may undertake special projects or pursue intensive study in a particular area. During the winter term of 1971, two Oberlin students, Alice Hieatt, a senior, and Helen Finch, a junior, spent the month of January at Gallaudet in an attempt to explore deafness and learn sign language. In part, as a result of their intense interest, negotiations were entered into between their project advisor, W. Dean Wolfe, Associate Professor of Communication at Oberlin, and Gallaudet Vice President John Schuchman, who at that time was Dean of Academic Affairs. A formal exchange student program was created between the two colleges providing that undergraduates from either college could spend a semester at the other. The purpose of the program was to promote greater mutual understanding of the hearing and the deaf worlds.

Oberlin students at Gallaudet were to have an academic advisor, room with hearing-impaired students, and pursue curricular and extracurricular activities. Gallaudet students at Oberlin were to be treated similarly. There were to be no special services, such as assigned interpreters and/or note-takers for deaf exchange students at Oberlin. It was expected that they would be received and would function as all other students at Oberlin. Their advisor was to be Mr. Wolfe and Oberlin students were to be advised at Gallaudet by Dr. Schuchman. Subsequently, he assigned the responsibility to this author.

The following year, 1973, Gallaudet entered into the same type of agreement with Western Maryland College in Westminster, Maryland, which had a newly organized graduate program in education of the deaf.

Both colleges are, as is Gallaudet, small liberal arts institutions; Oberlin is located about 30 miles southwest of Cleveland, and Western Maryland is located about 40 miles northeast of Washington, D.C.

The Gallaudet Admissions Office outlined basic requirements to be met by *special* and *exchange* students who sought the opportunity for temporary study at Gallaudet: junior or senior status, a B cumulative grade level, enrollment in a degree-granting program of an accredited college, and a commitment to be a full-time student and to live on campus.

Special and Exchange Students

During the ten-year period from Fall 1970 through Spring 1980, 99 special and exchange students, representing 52 colleges, attended Gallaudet for one or two semesters. A questionnaire consisting of 44 questions, an explanatory covering letter, and an addressed, stamped, return envelope, were sent to each of the former special students in July 1980. A follow-up letter was sent in September. Twelve questionnaires were returned by the Post Office as undeliverable. A total of 70 completed responses was received, 80% of the 87 letters presumed to have been delivered.

Of the original 99 students, 15 were from Oberlin. Ten of the Oberlin students had previously been

" . . . entering special and exchange students should have some familiarity with signs."

enrolled in one of the three winterterm projects taught by the author: An Introduction to Manual Communication and Orientation to Deafness, taught during January 1972, 1975, and 1978. Twelve students were exchange students from Western Maryland College.

This report is a summary of the data obtained from the 70 respondents, of whom 17% (12) were male and 83% (58) were female. They ranged in age from 19 to 26 at the time they were enrolled at Gallaudet (36% were age 20 and 34% were 21). Fifteen students spent two semesters at Gallaudet. There were 37 students on campus during fall semesters and 48 students on campus during spring semesters. The largest number of hearing students in the program at any given time was 13 in 1979 and 12 in 1977.

The 70 respondents represented 40 colleges. Students from Oberlin and Western Maryland Colleges, schools with which Gallaudet has a formal exchange program, constituted 18.6% (13) and 10% (7), respectively, of the total.

Of the 15 questionnaires sent to Oberlin students, one student did not respond and one letter was returned by the Post Office as undeliverable. Five of the 12 Western Maryland students did not respond. Almost 9% (6 students) who responded were from Clarion College (Pennsylvania) and 7% (5 students) were from Beloit College (Wisconsin). There were no more than two students from any of the other 36 colleges. One of the Oberlin exchange students to Gallaudet was a young woman who was profoundly deaf since very early childhood.

Career Choices

Eighty-four percent of the students reported that attending Gallaudet had influenced their career choice. Nonetheless, pre- and post-Gallaudet areas of academic concentration, as reported in the questionnaire, indicated no particular shift in academic focus. Perhaps the experience reinforced original choices. Seven percent asserted that their Gallaudet experience caused nonentry into any area of deafness.

The areas of academic concentration of the 70 undergraduate hearing students were education (36%), psychology (23%), hearing and speech (18%), drama (5%) and linguistics (5%).

Half of the respondents reported attendance in graduate school. The different graduate programs included education (43%), psychology (20%), hearing and speech (20%), and drama (3%).

As of December 1980, 75% were employed and 25% were still undergraduate or graduate students. Of the 9% who were graduate students, 3% were in medical programs. The employment status of those who were working is presented in Table 1.

Table 1
Employment Areas Reported by Gallaudet Special Students

Area	Number Responding
Teacher of the deaf	10
Audiologist/Speech therapist	9
Interpreter	7
Psychologist/Counselor	6
Dormitory advisor in a school for the deaf	3
Actress (in productions for hearing and deaf audiences)	2
Other	13

Survey Results

The survey elicited a variety of information pertaining to student attitudes and self-evaluations. The respondents judged their abilities to express themselves and to understand signs as having vastly improved during their stay on campus. Their self-ratings of being good or better expressive communicators jumped from 16% to 86% and their ratings of their receptive ability improved from 11% to 74%. At the time the data was collected, 23% were R.I.D. interpreters (level unspecified).

Although many felt that students should not be excluded because of a lack of knowledge of signs, there was general agreement (76%) that entering special and exchange students should have some familiarity with signs. About the same number (75%) voluntarily enrolled in sign courses while at Gallaudet. Referring to the time of their departure, 96% stated they felt comfortable with users of simultaneous communication, whereas only 57% felt similarly comfortable with users of American Sign Language (ASL). Eighty-two percent derived social satisfaction from their experiences at Gallaudet despite the repeated reference to the general social immaturity of Gallaudet students. Nonetheless, fewer than half (47%) felt that their presence had any influence on campus social life.

Prior to attending Gallaudet, only about one-fourth (26%) had had more than occasional contact with hearing-impaired people. Subsequent to their Gallaudet experience, 53% had professional contact and 44% had frequent social contact with hearing-impaired people.

In reflecting on their experiences, more than 80% felt that they had

" Some saw the experience at Gallaudet as clarifying their personal professional goals and career direction."

developed more positive attitudes toward the deaf and that hearing students on the Gallaudet campus did much to bridge the gap between hearing and deaf people. They thought they brought new ideas to Gallaudet students and that such contacts had mutual long-term effects.

In regard to academics, only 49% derived satisfaction. Sixty-nine percent asserted that hearing students had an advantage over deaf students in competing for grades, and 89% felt that this competition did not cause deaf students to work harder. In this connection, it was repeatedly stated, with consternation, that both students and faculty had lower expectation levels for student academic achievement than their ability indicated.

More than one-third of the special and exchange students believed that their presence in class affected the teaching style of deaf faculty, and almost half thought hearing faculty teaching style was affected by their presence. There was no indication of how such affects occurred.

More than half (60%) of the respondents said they had felt discriminated against because they were hearing. Nonetheless, an overwhelming 97% believed that both their negative and positive experiences had contributed greatly to their own personal and professional growth.

There was an open-ended question regarding individual, personal objectives for attending Gallaudet. As noted in Table 2, not all students listed the same reasons. However, in every instance it was reported that each individual's stated objectives had definitely been achieved.

Another open-ended question regarding the positive and negative effects of exposure to the *Gallaudet experience* revealed a variety of responses. It was necessary to group the many comments initiated by the respondents into general categories. Among the most frequently mentioned positive aspect was the opportunity to live, study, and interact with deaf peers in the deaf community and thus gain insights into deafness and the varieties of communication methods used by deaf people.

Table 2
Personal Objectives for Attending Gallaudet

Personal Objectives	Number of Respondents Reporting
To learn and/or improve sign communication	34
To socialize with and learn about deaf people and their culture	47
To get the *deaf experience*, understand discrimination and minority status	19
To explore the possibility of a career in deafness	17
To learn ASL and its linguistic structure	6
To take courses related to deafness not offered at home college	5
To study drama and the use of sign in that area	2
To become an interpreter	1

Another positive result to which respondents repeatedly referred was the personal growth and understanding they had developed from overall exposure. They emphasized the importance of their first-hand experiences in learning about discrimination, isolation, and minority status, i.e., being a minority in the deaf milieu which constituted the majority population.

Many students listed improved manual communication skills among their gains. Closely related to that was their increased interest in language in general.

Some saw the experience at Gallaudet as clarifying their personal professional goals and career direction. Other positive aspects that many respondents specifically mentioned were the opportunity to take deafness-related courses and courses with deaf as well as hearing faculty, the pleasure of small classes and a small college, and the satisfaction of living and studying in Washington, D.C.

One of the most often repeated negative aspects of the Gallaudet experience that respondents reported was the feeling of intimidation, frustration, isolation, and rejection, particularly by ASL users. The culture shock was something for which few had been prepared. Related to this was the observed or experienced anti- and pro-hearing prejudices that existed, although some of these negative feelings became less intense with greater on-campus exposure and integration.

Another recurrent negative theme related to low quality academics and low expectation levels of both students for themselves and certain

"The open-ended questions, in particular, revealed a great deal about the special students' attitudes and observations . . . . "

faculty for students, which resulted in the self-fulfilling prophecy. In this connection, the special students noted less than adequate communication skills and knowledge about deafness of some of the faculty.

Other less frequent comments related to the insufficient orientation given to hearing students (prior to admission to the Gallaudet program) about deafness, about course selection, about the possibility of rejection by deaf roommates because of their hearing status, and about Washington, D.C.

Two other negative comments that were mentioned by a number of respondents were the cliquishness of hearing graduate students who separate themselves from the deaf culture, and the social and academic immaturity of deaf undergraduate students.

Discussion

The open-ended questions, in particular, revealed a great deal about the special students' attitudes and observations since these responses were self-initiated comments. No analysis was made of the courses taken, the student composition (both hearing and hearing-impaired) in those courses, or the faculty teaching them. That is true both in regard to the negative criticism of courses in general and of the favorable evaluations made regarding faculty and course content in the Drama and Communication Arts (formerly Audiology and Speech) Departments.

Neither was analysis made of the year the student was at Gallaudet, of his of her own previous background, nor of the time lapse between being at Gallaudet and responding to the questionnaire. It is possible that both positive and negative opinions might become more or less reinforced with the passage of time.

Comments on the Special/Exchange Student Program

Computer printouts of key phrases, numbers, and percentages tend to minimize the impact of the written word. Consequently, it seems fitting, in discussing the effects of the Special and Exchange Student Program on participants, to include some unsolicited direct quotations from comments made in the questionnaire responses. The year the student participated in the program is given after each comment.

It was the best thing I ever did. I feel that educationally and personally the experience has made a tremendous difference in my life. I am glad to see that a follow-up is being done on the special students' program. I think it was a good program that was not fully utilized. I trust that by now the quantity and the quality of the program has improved. In my time it was left to run its own course with no outside influence, good or bad. 1972

After living, going to school, and growing with a variety of persons who are deaf, I find myself unable to tolerate the simplistic characterizations one too often encounters. Spending a semester at Gallaudet certainly enhanced my understanding of the effect that deafness can have on a person's life. It left an indelible reminder that there are as many ways of responding to a situation as there are individuals. The fact that the exchange program at Gallaudet can enable a hearing or deaf student to realize these kinds of fundamental truths shows the real value of the experience in human terms. 1973

My experience at Gallaudet really was the turning point in my professional life. 1974

I was continuously impressed with the knee-jerk reflex the faculty at Gallaudet had towards research on deafness. Most, not all, would only support or even tolerate mention in class of 'party line' research: deaf people are just the same as hearing, but they sign; sign is the only way, etc., etc. 1974

When I think about my "Gallaudet experience," I view it as one of the most difficult challenges of my academic career. I see it as a "gestalt" rather than a series of experiences. Over the past years I have come to greatly appreciate what my semester at Gallaudet meant to me. It offered a unique opportunity to grow personally and academically. I have retained my positive feelings about Gallaudet which will always continue to hold a very special place in my life. I would never have missed it. 1974

I came away from Gallaudet with an increased curiosity about language: what people do with it and vice versa. This was not specifically centered on deaf people and their problems, yet it was the extremity of my experience there that made me realize that nothing can be taken for granted. . . . That I always knew I would be an actress did nothing to lessen the seriousness of my studies. Gallaudet for me was a catalyst in the consolidation of the various academic talents that I had. 1975

Living in the dorm, I was amazed and appalled at how inconsiderate, socially immature, and unfriendly the other residents were. I value my time (there) but much of it was extremely unpleasant. My attitude about deaf people and the deaf subculture is much more negative than before my Gallaudet year. After Gallaudet I really doubt that I will ever consider working in a deafness-related field full-time. 1977-78

The best experience I had at Gallaudet was being shunned as hearing. The worst experience I had at Gallaudet was being shunned as hearing. 1979

In general, I consider my semester at Gallaudet about the most rewarding thing I've ever done and recommend it

"Fewer than 40% had had any connection with or knowledge of deafness prior to the program."

to students I believe are really serious about working with the deaf, not for the deaf. 1979

I feel many teachers tend to see the students' academic deficiencies as good reason to require and expect less from them, rather than trying to work on the deficiencies. Many students don't even seem to notice that much less is asked of them than at other colleges. It's almost like a deliberate deception, which could be very disheartening when the students find out that success isn't so easy in the rest of the world. I also think some people on campus still think of the students as 'the poor little deaf kids' which does nothing to help their image as competent human beings outside of Gallaudet, and doesn't help the students to learn better. 1980

Winter Term Project

Subsequent to the negotiation of a contractual agreement between Gallaudet and Oberlin College relating to a student exchange program, this author was invited to teach an intensive course entitled Introduction to Manual Communication and Orientation to Deafness. This course was incorporated into the annual winter term at Oberlin in January 1972. She has been invited to repeat the program each third year since (1975, 1978, 1981). It should be noted that Oberlin students are required to register for three winter term projects during their four-year tenure as undergraduates. However, selection of a project is voluntary and there is a wide range of possibilities from which to choose.

The first students to partake of the exchange opportunity were two young women from Gallaudet who spent the spring 1972 semester at Oberlin. However, they arrived on campus early enough to become involved in the winter term course during the last week of the minimester. Their presence and involvement greatly enhanced the effectiveness of the program.

This study is based on responses to a questionnaire sent to the participants involved in the three winter term projects between January 1972 and January 1978. A brief questionnaire was devised and sent with a cover letter and stamped return envelope to 80 former enrollees in July 1980. A follow-up letter was sent in September. Six questionnaires were returned by the Post Office even when sent to a second address. Fifteen of the participants never responded. The 59 replies received constitute an 80% response. (The breakdown of responses by year is 1972, 85%; 1975, 75%; 1978, 80%.)

The 23 returns from the 1972 students are equivalent to 39% of the total responses; the 21 from the 1975 group make up 36%; and the 15 from the 1978 session are 25% of the total.

Of the respondents, 20% (12) were male and 80% (47) were female; at the time of participation they ranged in class from freshman to senior. The greatest number, however, were first-year students. Their undergraduate majors, as reported, were science and mathematics (22%); communication and linguistics (22%); psychology (17%); art, music, or religion (15%); social science (10%); languages (English or foreign) (10%); and other (3%).

Survey Results

As spelled out by the students, the primary reasons for selecting this particular winter term project were as follows:

1. It seemed a useful skill; they wanted to learn and/or improve their existing minimal sign language skills (33%);
2. Curiosity; it sounded like a new challenging opportunity; a friend's influence; they needed a project (26%);
3. They were interested in exceptional children, individuals, handicapped special education, deafness (including the desire to help the Gallaudet exchange students who might come to Oberlin) (23%);
4. They had an interest in language, communication, nonverbal communication, and linguistics (18%).

Fewer than 40% had had any connection with or knowledge of deafness prior to the program. The connections reported by this group included having a deaf friend or deaf family member; a personal hearing loss; a previous course in the Communication Department at Oberlin or an Exco course in signs (given, for the most part, by former students of the winter term programs or exchange students to Gallaudet).

Some 53% claimed to have had contact with deaf people after their participation. Among the kinds of contacts listed were having deaf roommates (Gallaudet students) and friends, taking the interpreter training program at NTID, and being graduate students at Gallaudet. Ten of the total number went to Gallaudet as undergraduates in the exchange program between 1972-1975 and 1979-1980.

Fifteen (25%) of the students reported that they had taken courses related to deafness, in speech, linguistics, and/or education during their college careers.

Thirty-nine percent asserted that participation in the winter term project had influenced their career choice. Among those choices mentioned were education, including education of the deaf and special

education (17%); the helping professions, encompassing psychology, counseling, mental health, therapeutic recreation, and interpreting (17%); science and medicine (10%); hearing, speech, and language (5%); programming, art, religion, and law (15%). More than 20% were still undecided at the time of their responses.

Of the 35, or 59%, who reported that they were currently in a graduate program or had completed one, the primary areas of concentration were education (23%), counseling and rehabilitation (17%), and communication and linguistics (14%).

Among those currently employed, 21% were in education, counseling, and/or interpreting. Ten percent of that number were actually employed as teachers of the deaf.

The geographic distribution of the respondents at the time of the questionnaire was 31% in the northeast, 38% in the north-central region of the U.S., 18% in the south, and 7% in the west.

Forty-one percent reported currently having social or professional contact with hearing-impaired people. Although not all of them continue to use manual communication, 78% had used sign language since the completion of their winter term project.

A final open-ended question asked about the impact, if any, that participation in the project had had on the individual's personal growth and general knowledge. Responses were grouped by the investigator. The major points cited are listed in Table 3.

Unsolicited random comments from participants in the various winter term projects are included below, along with the year they were in the program.

I feel very strongly that the winter term project was responsible for fostering the development of many perceptions and attitudes I have come to value in my personal and professional life. The dynamic guidance encouraged those of us in the project to seek understanding of persons with experiences and backgrounds different from our own, to share our similarities and differences and above all to do so with respect. 1972

Contact with deaf people at Gallaudet and at Oberlin did contribute to my intellectual and emotional knowledge of people, language, and myself (especially the experience of being in a distinct minority at Gallaudet). On a purely pragmatic level, this item of experience on my resume has proved to be very interesting to employers—they invariably comment on it in interviews. 1972

It opened a new awareness to the use of total communication. I had planned on teaching deaf children, but discovered that children in this (geographic) area were taught only by the oral method. Those in charge had no intention of listening to any new methods. I now teach perceptually impaired early learners and make good use of my experiences. 1972

I think that winter term was the beginning of an ongoing fascination with communication: I discovered that language and communication aren't interchangeable terms. I wrote that the project didn't affect my career choice. While true in a direct sense, my exposure there has had an influence after the choice was made. I have started taking sign language again recently, because I hope to be fluent enough to be able to provide services for families with deaf as well as hearing members. 1972

I learned the power of language and its deprivation, and what it means to be a true outsider. I learned how much can

Table 3
The Impact of the *Introduction to Manual Communication and Orientation to Deafness* Course on Oberlin Students

Impact	Number of Repondents Mentioning Impact
Heightened, expanded, and increased awareness of and sensitivity to deafness and other handicapping conditions and the needs of people with them.	30
Became sensitized to the power and importance of language and language systems, cultural differences, and communication problems in general. Fostered perceptions and attitudes about differences among people.	18
Influenced career or career choice directly or peripherally.	17
Served as an introduction to another language and an unfamiliar segment of the population.	13
Had an influence on making new friends.	13
Contributed to self-knowledge, general educational and personal growth and enrichment.	10
Influenced others to learn sign language; applied knowledge in scuba diving.	7
Led to becoming an exchange student at Gallaudet.	4

" . . . an 84 item questionnaire was sent to 11 Gallaudet students who had . . . spent one semester as exchange students . . . . "

be shared of a major difference in culture and outlook with sympathy and understanding, and how much can never be shared. 1975

Knowing sign language helped foster greater communication between me and my (deaf) parents, particularly my stepfather. Our relationship became warmer and more sympathetic. Seeing the results persuaded my brother that he too should learn sign language and he took a course last winter here in the university. I hope you can keep on going with workshops at Oberlin to bring the situation of deaf people to a larger understanding. 1975

As an individual who works underwater, an effective method of communication is critical to a successful dive. Training dive partners in basic systems is an important facet of diver training. As a Scuba Instructor, each of my students has been instructed in fingerspelling and a few rudimentary signs. All students are encouraged to seek out further instruction. 1975

It gave me great insight into and understanding of some of the aspects of deaf and other handicapped persons. As my first happy experience with another language I learned a lot about the power and importance of language and that yes, some people actually think and express in a different medium. The course was very challenging and satisfying for me. The time of the project itself was wonderful and exciting. It was a great and intense learning experience. 1978

It gave me a kind of mental toe-hold on deafness and its myriad of social, cultural, and psychological implications. It prevented the growth of a "deaf stereotype" in my mind, and that spilled over some little bit into the rest of my life. . . . More and more I tend to look at the *whole* person, take into account the wide scope of influences that mold an individual. The winter term project led to my becoming an exchange student at Gallaudet. 1978

Gallaudet Exchange Students

During the summer of 1980, an 84 item questionnaire was sent to 11 Gallaudet students who had, between the spring of 1972 and the fall of 1979, spent one semester as exchange students on other campuses. Eight of the students went to Oberlin College and three went to Western Maryland College. The data detailed here was derived from the ten responses (91%) to that inquiry.

The students who participated in the program ranged in age from 19 to 28. Each of four was the only hearing-impaired student on the exchange campus when he or she attended. Nine of the students were deaf and one was hard of hearing. The age of onset of hearing loss for 80% of the respondents was before age three and for 20% it was between ages three and ten.

An analysis of the hearing status of close family members revealed that

1. 20% (2) had hearing parents and no siblings;
2. 30% (3) had hearing parents and a total of seven hearing siblings;
3. 10% (1) had hearing parents and two deaf and six hearing siblings;
4. 20% (2) had one hearing and one hearing-impaired parent and each had one hearing sibling;
5. 20% (2) had two deaf parents and a total of three deaf siblings.

Prior to their admission to Gallaudet College, 30% (3) had been educated exclusively in residential schools for the deaf. Thirty percent (3) had spent from two to eight years in day schools or day classes for the hearing impaired. Thirty percent (3) had attended public schools for hearing students for 13 years; 30% (3) had spent seven or eight years in public schools.

Undergraduate areas of concentration at Gallaudet for 60% (6) had been in education, psychology, or social work. At the time they responded to the questionnaire, 30% (3) were still undergraduates, enrolled in psychology or linguistics, and 40% (4) either had or were attending graduate school, in education or counseling.

The questionnaire included a series of questions regarding communication skills. Self-evaluation revealed that 50% (5) considered their oral skills to be fair or poor, whereas the other 50% (5) regarded their speech competence to be good or excellent. Seventy percent (7) stated that their ability to lipread was good or excellent. Although prior to their going on the exchange program, 50% of the students had had frequent or regular contact with hearing people, initially at a *hearing* college, 80% (8) felt uncomfortable communicating with hearing students and faculty. However, at the end of the semester and the exchange experience, 90% (9) felt comfortable in communicating with those same groups of people. More than half used the oral-aural mode, whereas 20% (2) relied primarily on written communication.

Five of the students had no interpreters in the academic setting. The other five were assisted in some classroom situations by volunteer or newly trained, paid student interpreters.

Survey Results

There was a variety of questions regarding exchange experiences. Only 10% (1) of the students reported fair satisfaction academically, while 90% (9) found great academic satisfaction at the exchange college. Thirty percent (3) reported that the experience influenced their career choices, and 20% (2) stated that the exchange undergraduate experience

"There was almost unanimity . . . that Gallaudet should expand its exchange program to extend to other colleges . . . ."

had influenced them not to pursue graduate study at Gallaudet.

As was indicated earlier, prior to the exchange, 50% (5) of the exchange students had had minimal contact with hearing people. Fifty percent (5), although not the same people, reported experiencing positive social satisfaction while at the exchange college. Since the exchange, 70% (7) reported having frequent professional association with hearing people, and 60% (6) had social contact with hearing people.

An analysis of attitudes expressed by the Gallaudet exchange students reveals some interesting opinions. Most of the respondents agreed that their attitudes toward hearing people had improved and more than half stipulated that they felt that their presence helped bridge the gap between hearing and deaf people. Eighty percent (8) indicated that they worked harder than usual because they were competing with hearing students. Although more than 70% felt inhibited in classes because of their level of communication skills, they were not inhibited because they did not want visibility. Only 30% (3) felt discriminated against on campus because of their deafness.

The students' opinions were mixed regarding whether or not their presence influenced the general classroom atmosphere or whether they brought new ideas and interest to their exchange college classes. However, there was complete unanimity that their unique exchange experience contributed to their own individual personal and professional growth. Ninety percent (9) concurred that their presence in no way influenced the teaching style of their professors; in general, although the students felt that teachers' attitudes toward them were helpful and positive, there was 100% expression of the opinion that teachers expected the same performance from them as they did from other students. There was the same agreement that their presence on campus had no academic impact. However, half thought that their presence had some social impact.

Forty percent (4) stated they were the only hearing-impaired person on the campus at the time of the exchange. The other 60% (6) indicated that there was at least one other deaf student, and at one time there were two others. Over half (60%) of the students disclosed that their out of class contacts with hearing students were limited.

There was almost unanimity in the belief that Gallaudet should expand its exchange program to extend to other colleges, both large and small, which would provide both interpreters and notetakers. Seventy percent (7) thought that the expanded program should be with colleges that have regular programs for hearing-impaired students. Almost as many agreed that an expanded exchange program should be with colleges in geographic areas where there are also deaf communities.

In this survey, as in the others, there were several open-ended questions relating to individual student objectives in electing to become exchange students and the positive and negative effects of their experience. The results are found in Table 4. Each student indicated the belief that all stated objectives had been achieved.

In discussing their perception of their impact on the students at the two exchange colleges, 80% (8) of the Gallaudet students expressed the notion that hearing people on the two campuses developed much greater awareness of the ramifications of deafness, especially that there are indeed individual differences among deaf people and that barriers need not be insurmountable.

There was other evidence of the impact of their presence, including influencing hearing students to go to Gallaudet as exchange students; helping some students to learn or improve sign language skills; influencing students to explore deaf education as a possible career choice; and developing personal friendships. One student felt he had had no impact on the hearing students on campus because he had associated primarily with the deaf graduate students on that particular campus.

Among the positive effects of the exchange experience, on the deaf students as individuals, was the benefit and satisfaction of the greater educational challenge (a comment which was initiated by 60% of the respondents). Other outcomes were encouragement to apply to hearing graduate schools, and a change in personal career choice of one individual from business administration to education (of the deaf).

Among the negative aspects of the varied experiences was the inadequacy, or lack of, interpreters, which was mentioned by 40% (4) of the students. An equal number described frustration and loneliness and recommended that there be at least two deaf exchange students at a time to a given campus in order to somewhat alleviate that negative consequence. Some were distressed at the lack of tutoring or feedback even from classmates who could communicate with them. Others felt that one semester was too short a period of time to spend on the new campus. Thirty percent (3) specifically pointed out as a negative feature the insufficient orientation to procedures and probable interactions on the exchange

" . . . just as hearing people need orientation to deafness, deaf people could benefit from workshops regarding the hearing."

Table 4

Personal Objectives for Attending Oberlin as Exchange Students

Objective	Number of Respondents Reporting
To experience greater academic challenge	9
To enhance self-development and personal goals	9
To learn to cope with hearing people	9
To experience a change from the deaf culture at Gallaudet	7
To determine personal preferences for deaf or hearing social contact	2
To give hearing people a greater awareness of deafness	2

campus. It was stated that just as hearing people need orientation to deafness, deaf people could benefit from workshops regarding the hearing. In this connection the comment was made that more Gallaudet students should avail themselves of the opportunity for exchange, but no suggestions were made as to how they might be encouraged to do so.

The following comments were made by Gallaudet students in regard to their exchange program.

Gallaudet exchange students should be given advice on how to better interact at the exchange college—how to make the most of it. The time was too short and I was too young. I should have interacted more. 1972

In some ways it was a culture shock living in a completely hearing environment, and ironically enough, it was even more of a culture shock when I returned to Gallaudet. So, if there are workshops for hearing people about the deaf, maybe there should be workshops for the deaf about the hearing. 1972

I was 20 years old when I first met a deaf person, though I was born deaf. I wanted to see how I had changed with hearing people after two and a half years at Gallaudet. Before Gally, I thought the deaf were not for me. But after (the exchange college) I realized I would much rather be in the social circle of the hearing impaired. Yes, I achieved my objective. I found my identity as a deaf person and was comfortable with it, without any doubts, for the first time. 1972

I feel there should be an orientation week for exchange students. My first few weeks were extremely difficult and frustrating. Also I would like to see two or more exchange students because this provides more support for each other. From my point of view, I see the deaf exchange students' benefiting more from colleges that have programs like CSUN, NTID, etc., than from programs in colleges where they are the only deaf students. 1974

I wanted to see how much I could function in a totally nondeaf environment. I think I achieved quite a bit. I think I could have made a lot out of the classroom experience if I was keen enough about the concept of interpreting and if I was as skilled in using one as I am now . . . I'd encourage any potential exchange student to first use an interpreter by taking a consortium course the semester before. Also an orientation on how to use interpreters to become a participant in class discussion would help. 1974

In a way, I needed a break from Gallaudet. . . . I wanted to go to a school where each student is known and accepted as an individual. Gallaudet tends to "clump up" too much into distinct groups (oral-manual, this sorority or that sorority, etc.). I left (exchange college) with an even stronger hold on my beliefs that self-identity is more worthy than a flimsy identity based on association with a particular group (club, Greek organization, etc.). I believe my exchange experience was good preparation for entrance into "life after Gallaudet." I became more prepared to tackle confrontations of all kinds, without dependence on an interpreter. I developed more independence financially and emotionally. 1978

I wanted to challenge myself by going to a hearing college to see if I could function. Yes, I found I could manage quite well, provided there were interpreters and notetakers. There were times when it was lonely because of communication difficulties. I am seriously thinking of pursuing graduate studies at a hearing college. 1979

I needed a change from the deaf culture at Gally and also felt limited academically at Gallaudet. I liked the academics at (exchange college) and felt the content of the courses taken went into more depth. I definitely would attend a hearing college or university for my master's, hopefully with assistance of an interpreter and notetaker, to profit more. There were times when I felt frustrated and lonely and it would have been helpful to share my feelings with another deaf student. 1979

Conclusions

Each survey revealed overwhelming success from the viewpoint of individual participants, even though much of it was not objectively measurable. The exposure of deaf to hearing students, of hearing to deaf students, and of hearing students to information about and communication with the hearing impaired all attest to the benefits derived from each of the three programs and to

" . . . the recommendation was urgent: that the Special and Exchange Student Program to and from Gallaudet and the Oberlin Winter Term Project be maintained."

the urgent need, desire, and recommendation for their continuance. Not least among the difficult to quantify results is the long-term awareness, understanding, and empathy created for people and their individual differences, be they hearing, deaf, or otherwise disabled or handicapped.

In each instance, regardless of the experience of frustration, isolation, or minority status, the recommendation was urgent: that the Special and Exchange Student Program to and from Gallaudet and the Oberlin Winter Term Project be maintained.

By extension, it must be concluded that a structured exposure of hearing and hearing-impaired people to each other has lasting positive effects. Even if the contact does not result in eventual professional involvement, the experience has enduring impact on people's lives.

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Postsecondary Transfer Opportunities for Hearing-Impaired Students

James Biser

Postsecondary institutions offering educational opportunities to hearing-impaired persons have expanded significantly since the late 1960s. Two national programs, four regional programs, and many state and local junior colleges, community colleges, technical-vocational institutes, and rehabilitation centers have implemented special programs for hearing-impaired students. The 1981 edition of *A Guide to College/Career Programs for Deaf Students* lists 57 such postsecondary programs, and the April 1981 issue of the *American Annals of the Deaf* lists 84 programs. By comparison, the 1973 edition of the guide listed 27 postsecondary programs. In addition, the passage of Public Law 94-142 and Section 504 of the Rehabilitation Act of 1973 has added impetus to the expansion of the educational opportunities for hearing-impaired students in many colleges and universities without designated programs for hearing-impaired individuals.

Currently, a number of hearing-impaired students are involved in transferring from one institution to another, and it is predicted that this trend will increase due to the expanding opportunities. Such movement from one institution to another will occur as hearing-impaired students parallel the experience of hearing students in utilizing transfer as a vehicle for (a) moving to a higher level of academic and/or career skill development; (b) changing their career goals and pursuing new goals; or (c) finding a new postsecondary setting for continuing their college education.

It is important for professionals who advise hearing-impaired students about their selection of a postsecondary institution to recognize the likelihood that these students may transfer, to deal with the concept of transfer, and to advise accordingly. To that end, this article addresses current transfer practices, along with several issues, concerns, and recommendations which have been raised by representatives of postsecondary institutions since the early 70s.

Current Practices

A good perspective on current transfer practices of *hearing-impaired* college students can be gained by examining transfer practices of *hearing* college students. Typically, a transfer student is defined as a person who has completed studies at another institution and may or may not have earned a degree. In the transfer process, the receiver college will endeavor to place the student at the highest level where success can reasonably be expected. Junior class standing may be granted if the transfer student has earned an associate's degree (AA, AS, or AAS) or equivalent in a program (major) comparable to the program he or she selects at the receiver college. A certain cumulative grade point average (e.g., *C* or better cumulative average) is usually required, but may vary from institution to institution.

If a transfer student has had only a small amount of college study, or is making a significant program change, the receiver college will determine transfer credit based on an evaluation of individual courses. Admission will be based on a prediction of probable success in the transfer student's selected program, and the class placement will be based on earned credits applicable to his or her program choice.

Important factors in the transfer process are the receiver school's relationship with and knowledge of the feeder institution, the type of credit system (quarter vs. semester), and the receiver school's experience with transfer students. Also of particular importance, especially for students wanting to transfer from a two-year institution, is the student's program choice at the two-year school.

Most two-year schools have two program tracks (Watts, 1975). One is a *terminal track* directed primarily toward the development of specific job skills and preparation for employment upon graduation. The second track is a *transfer track* which is often directed toward either employment or transfer upon graduation. Clearly, the transfer process is smoother and fewer credits are lost for students transferring from the transfer track. Transfer track programs are more comparable to programs at receiver colleges and often have academic demands similar to those of receiver colleges.

The transfer process for hearing-impaired students is not as well defined as it is for hearing students; consequently, this process is often determined on a case by case basis. Without a well-defined process and stated transfer criteria, there may not be consistency from one case to the next. This can result in a greater likelihood of denial of admission, fewer credits accepted, or lower class placement. In addition, several other factors complicate the transfer process for hearing-impaired individuals.

1. Few hearing-impaired students at two-year colleges are enrolled in *transfer track* programs. Instead, most are enrolled in *terminal track* programs.
2. Because of serious educational deficiencies, hearing-impaired students earn a number of credits in preparatory or remedial courses, and these are seldom accepted for transfer credit.

" . . . increasing attention has been directed to the transfer situation since the early 1970s."

3. Even after remediation programs, many students may not attain the minimum admission standards of the receiver colleges.
4. The experience with hearing-impaired transfers between feeder and receiver institutions is limited, and important working relationships usually have not been developed.

These factors and others are very real, and they prevent the smooth transfer from one institution to another. However, increasing attention has been directed to the transfer situation since the early 1970s. During that time, the principle of appropriate and flexible transfer among postsecondary institutions has been articulated often.

Proceedings of the 1970s

The publication, *Principles Basic to the Establishment and Operation of Postsecondary Programs for Deaf Students* (CEASD, 1973), states:

> Flexibility should be exercised in permitting the student to select and modify his educational and career goals both within the institution and through transfer to another institution.

Administrators and staff members of postsecondary programs for the deaf were called together in February 1974 by the CEASD Committee on Postsecondary Education (Note 1). Considerable attention was given to student transfer during this meeting. The committee reported that

> . . . there are two basic needs pertaining to transfer. The first involves the fundamental purposes served, and the second involves the mechanisms necessary to facilitate the process for students.

With regard to the fundamental purposes, these participants recognized the need for flexibility in the transfer process, and promoted the principles that students should have the opportunity to transfer and be assisted in transfer when (a) a higher level of academic and/or career skills could be attained; (b) career goals are altered and another realistic career choice could be pursued; and (c) voluntary withdrawal or dismissal occurs and attendance at another institution is desired.

A major obstacle to the flexible transfer process identified by the group was the *employment syndrome*. Although job placement is a major goal of education, it should not be the sole criterion of success, and it should not interfere with the student's option to transfer if this would assist in realizing his or her full potential. Of equal importance was the belief that funding agencies and professionals serving the hearing impaired must reflect an attitude that supports and facilitates the the transfer process.

In addressing procedural questions, it became clear to the participants that further meetings would be needed to begin working on interinstitutional agreements which would facilitate the transfer process.

In January 1977 a Postsecondary Program Articulation conference was held at Gallaudet College, and the issues related to transfer were discussed again. It was decided that a special interest group composed of representatives from several postsecondary institutions would convene at the National Technical Institute for the Deaf (NTID) to establish principles, identify issues, and recommend actions to be taken relative to the transfer question.

This working committee of ten participants convened in December 1977 at NTID (Note 2). The goal of the conference was to establish policies and procedures which would facilitate the transfer of hearing-impaired students from one postsecondary institution to another, when such movement was in the best interest of the student. To this end, problems and/or obstacles which could hinder this goal were identified and possible solutions were generated. The issues identified as serious and urgent were

1. Inadequate communication among people responsible for handling and advising transfer students;
2. Lack of appropriate publicity and information to transfers;
3. Little or no information on admission criteria for transfers;
4. Misunderstandings with regard to credit evaluation and acceptance of previous courses for credit; and
5. Insufficient comparability (compatibility) of programs (majors) between feeder and receiver institutions.

Several recommendations were made and selected for implementation as first steps toward bringing understanding and flexibility to the transfer situation. The recommendations included the following:

1. Investigate and plan another conference on the transfer issues to include as many schools as can participate;
2. Designate a contact person with regard to transfers. This person should accept the responsibility for participating in further activities with regard to the transfer issue and for coordinating the transfer of students to and from the institutions;
3. Package information regarding transfers;
4. Publish criteria for admission of transfers;
5. Propose a recruitment format

"... professionals working with hearing-impaired persons at the secondary and postsecondary levels should strongly consider incorporating the concept of transfer into their advisement ...."

with appropriate information and publicity;
6. Incorporate the transferring concept into career counseling or interviews;
7. Propose changes in the *Guide to College/Career Programs for Deaf Students* to provide information for transfer students.

A report of the working committee was prepared for the CAID Conference in Austin, Texas, in June 1979. It was presented at the special interest group meeting for postsecondary education of the deaf. The issues and solutions specified earlier were generally accepted. Since that time, several institutions—on an individual basis—have begun to address some of the issues, but no concerted effort among institutions has been made. In discussions with personnel at other institutions, the concept of flexibility in the transfer process for hearing-impaired individuals is still a goal to which most agree; however, the procedural mechanisms necessary to facilitate the process for students have not been developed.

Conclusion

In lieu of a current national approach to the transfer issue, professionals working with hearing-impaired persons at the secondary and postsecondary levels should strongly consider incorporating the concept of transfer into their advisement efforts. They should learn as much as possible about the feeder and receiver institutions with regard to comparability of programs (majors), admission criteria for transfers, transfer of credits earned, policies of funding agencies on transfers, and services for transfer students.

In conjunction with these advisement efforts, it is hoped that administrators of postsecondary institutions can reaffirm their commitment to the development of a flexible transfer process. In this way, hearing-impaired students will be better able to exercise their option to transfer, and will be able to gain access to greater opportunities in higher education.

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Influences on Academic Achievement of Hearing-Impaired Students Born during the 1963-65 Rubella Epidemic

Thomas E. Allen
Michael A. Karchmer

In this article, the academic achievement test performance across a five-year period is examined for a sample of 330 hearing-impaired students, all of whom were born between September 1964 and August 1965. This 12-month period was selected for study because it represents the peak period for births of children with hearing loss resulting from maternal rubella. More than double the number of hearing-impaired children were born in 1964 and 1965 than in the years before or since. In the majority of these children, hearing loss was due to maternal rubella (Trybus, Karchmer, Kerstetter, & Hicks, 1980).

This study was undertaken to determine the degree to which maternal rubella—as a cause of hearing loss—influences academic achievement, as measured by the Special Edition for Hearing-Impaired Students of the Stanford Achievement Test (SAT-HI).

Students whose hearing losses were caused by maternal rubella differ as a group from other hearing-impaired students (Trybus et al., 1980). As will be reviewed subsequently, rubella status relates to such variables as sex, ethnic group status, additional handicaping conditions, and degree of hearing loss. Any differences in achievement test performance as a function of rubella status must therefore be viewed in the context of the interrelationships of these other variables.

The present analysis is particularly timely because hearing-impaired students born during the 1964-65 period will soon be reaching an age when they are considering postsecondary educational alternatives. Planners within postsecondary programs that serve deaf students are faced with potentially surging enrollments that will include a large proportion of persons with deafness caused by maternal rubella. An understanding of the relationships among maternal rubella as a cause of deafness, academic achievement, and other educationally related factors is critical if appropriate services are to be provided for this group.

The current study explores the various interrelationships among a set of educationally relevant variables that includes cause. (In the present context, since our primary concern is to delineate the effects of maternal rubella as a cause versus all other causes, the *cause* variable will be defined as whether or not an individual's deafness is attributable to maternal rubella.) In studying these interrelationships we will perform a path analysis with data collected as part of a longitudinal study in which demographic and achievement test information was obtained on a national sample of hearing-impaired students. Each of the students in the sample was tested with the SAT-HI five years apart, first in 1974 and again in 1979.

The analysis involves the following steps:

1. Selection and description of variables shown in the literature to affect achievement;
2. Selection of a sample for analysis for which results will be meaningful from both theoretical and practical perspectives;
3. Specification of a model consistent with what is known about all the bivariate relationships among the variables selected for the analysis; this process includes
   a. arranging the variables in temporal order,
   b. specifying the anticipated causal paths among the variables,
   c. assessing the limitations of the proposed model;
4. Testing of the model.

Before describing the analysis, we will discuss the path analytic technique in more detail.

Path Analysis: A Brief Introduction

Path analysis is a term describing a variety of statistical techniques that can be applied to a set of data in order to assess the correctness of an hypothesized causal model. There are different types of models depending upon the manner in which the variables included are hypothesized to interact. In the present context it is important to distinguish between *recursive* and *nonrecursive* models. In recursive models, all causal paths are unidirectional; there are no feedback loops. Variables affect only those other variables that appear subsequently in the model. For example, IQ level might have a direct causal effect on academic achievement, but it could not be claimed that achievement affects IQ.

In a nonrecursive model, feedback loops can occur. For example, teacher expectations might be considered a cause of achievement level; however, it might also be assumed that student achievement level affects teacher expectations. A path analysis would have to estimate the strength and direction of the reciprocal relationships (paths).

In the present study, a recursive model will be constructed because the variables can be ordered temporally. Figure 1 illustrates the schema that will be used. In this schema, certain conditions present at birth give rise to certain handicapping conditions which, in turn, are presumed to influence educational outcomes.

The advantage of arranging a set of variables into a path model is that

"The variables selected for the . . . analysis are . . . reading comprehension and math computation . . . ."

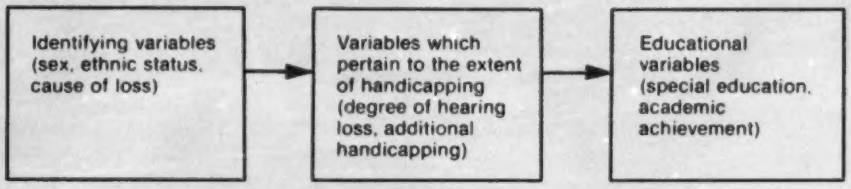
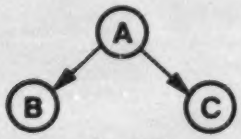

Identifying variables (sex, ethnic status, cause of loss)
Variables which pertain to the extent of handicapping (degree of hearing loss, additional handicapping)
Educational variables (special education, academic achievement)

Figure 1
A Recursive Model

the observed bivariate correlations can be broken down into three separate kinds of effects—*direct*, *indirect*, and *spurious*. A high correlation between two variables can result when one causes the other. This is called a *direct* effect. However, two variables can have a high correlation when they are mutually caused by a third variable or set of variables. This is called a *spurious* effect. For example, the yields of two different crops in the same garden may be highly correlated, but these are mutually caused by a prior set of conditions, such as weather, nutrient level of the soil, etc. A spurious effect can be represented diagrammatically as follows:



Variable B and variable C may show a high correlation, but this results from the fact that they are mutually caused by variable A.

An *indirect* effect occurs when one variable mediates the causal relationship of two other variables. For example, a particular cause of hearing loss may show a high correlation with achievement level, but the effect may be indirect, via a higher likelihood of profound hearing loss among students whose hearing loss is attributable to that cause.

In proposing a model, it is necessary to specify the anticipated effects before exploring the data. It should be emphasized that path analysis is not a technique for searching for causal relationships. It is a way of supporting or refuting models that are derived from theory or from a body of previous research. Path analysis provides a reasonable way in which demonstrated relationships can be assimilated into larger models.

In a specified model, paths can carry positive, negative, or nonsignificant weights. When variables are dichotomous, a positively weighted path (+) indicates that the presence of the prior attribute leads to the *presence* of the subsequent attribute. Conversely, a negatively weighted path (−) indicates that the presence of the prior attribute leads to the *absence* of the subsequent attribute. When paths are nonsignificant (0), it means that the path is not of sufficient magnitude to justify a conclusion that a linear relationship exists.

The purpose of path analysis is to estimate the strength and direction of the proposed relationships. Numbers, called path coefficients, are assigned to paths; they take on values between −1 and +1 which represent the impact that one variable has on a subsequent variable, controlling for all the variables in the model which precede the predictor. The coefficients can be estimated using least squares multiple regression. The magnitude of the obtained coefficients (also called beta weights or standardized regression coefficients) can be tested against the null hypothesis $P_{ij} = 0$. To perform the analysis, each variable is regressed on all the variables which occur prior to the model. Paths that carry weights that are not significantly different from zero are dropped from the model and the regressions are performed again. This time each variable is regressed on all of the prior variables which were demonstrated to have significant direct effects in the first analysis. The newly derived coefficients, if significant, are reported. The obtained model can be assessed for the degree to which it confirms the researcher's expectations. Direct, indirect, and spurious effects can be delineated for each bivariate relationship.

Step 1: Selection and Description of the Variables

The variables selected for the path analysis are academic achievement test scores for the reading comprehension and math computation subtests of the SAT-HI and six demographic variables that characterize hearing-impaired students' backgrounds, extent of disability, and special educational placements. The achievement test scores were obtained from test administrations in 1974 and 1979. The demographic variables are the core of the Annual Survey of Hearing-Impaired Children and Youth, which is a nationwide project conducted yearly by the Office of Demographic Studies through which educationally relevant data are obtained on hearing-impaired students receiving special educational services.

The demographic variables to be analyzed pertain to students' sex, ethnic group, cause and degree of hearing loss, handicaps in addition

"The sample of hearing-impaired students examined in this study is a subgroup of a larger sample . . . ."

to hearing loss, and type of special education program attended.

With the exception of degree of hearing loss, all of the demographic variables are either categorical (where the possible values are not orderable) or are dichotomous (which can take on only one of two possible values). In order to satisfy the path analytic assumption that all variables have linear relationships with one another and in order to keep the model comprehensible, we have dichotomized *all* of the variables except the achievement scores. Specifically, these variables have been defined so that each takes on a value of 1 or 0 for each person in the sample, depending upon his or her status with regard to the variable. Information may be lost when variables are dichotomized. For example, dichotomizing individual ethnic status as white versus non-white means that minority groups cannot be differentiated; it will only be possible to discern whether being a member of a minority ethnic group affects, either positively or negatively, other variables in the model.

The variables and their values are defined as follows:

Minority Status
- = 1, if student's ethnic status is *not* reported to be white
- = 0, if student's ethnic status *is* reported to be white

Rubella Status
- = 1, if cause of deafness is reported to be maternal rubella
- = 0, if cause of deafness is any other known cause

Sex
- = 1, if student is male
- = 0, if student is female

Presence of Additional Handicaps
- = 1, if additional handicaps are reported
- = 0, if no additional handicaps are reported

Degree of Hearing Loss
- = 1, if better ear average is greater than 90 dB, ISO, i.e., profound loss
- = 0, if better ear average is 90 dB, ISO, or less

Placement in Part-time Special Education Program
- = 1, if student has attended a part-time special education program from 1974 through 1979 (i.e., partially mainstreamed)
- = 0, if student has attended a full-time special education program from 1974 through 1979 (e.g., special school for hearing impaired or other full-time program)

1974 and 1979 Achievement Level
The reading comprehension and math computation subtest scaled scores from the SAT-HI. The 1979 achievement level has been included in the model in order to assess achievement growth or gain; gain can be implied because the effects of prior achievement will be statistically controlled.

It should be noted that the minority status variable is not a pure measure of a student's race or ethnic status. Non-whites in the United States tend, on average, to have incomes significantly lower than whites (U.S. Bureau of the Census, 1980). This income difference has also been found for families with deaf children (Rawlings & Jensema, 1977). Unfortunately, the Annual Survey does not include questions pertaining to family income or related data. Minority status must therefore be regarded as a surrogate measure for socioeconomic class as much as an indicator of ethnic status.

Step 2: Selection of a Sample

The sample of hearing-impaired students examined in this study is a subgroup of a larger sample from a longitudinal study of academic achievement conducted by the Office of Demographic Studies (ODS). In the spring of 1979, the ODS contacted the 119 special education programs across the United States whose students had participated in the spring 1974 test standardization program for the SAT-HI. (See Trybus & Karchmer, 1977, for a description of the 1974 project.) The programs were asked again to use the SAT-HI with as many of their students as possible, especially those who had been tested five years before. The programs could administer as many of the subtests as they wished, but were asked to give the reading comprehension and math computation subtests in all cases.

A large majority of the 119 programs participated in the longitudinal study. Several of the programs had ceased operation during the five-year period from 1974 to 1979; others did not participate because no students were still enrolled who had been in the program five years earlier. Only a small group of the remaining programs chose not to participate for other reasons. Altogether, during the spring of 1979, 75 programs submitted data on a total of about 5,000 hearing-impaired students. Approximately 1,600 of these students also had academic achievement test results available from the 1974 project.

To form the present sample, students born during the period from September 1964 through August 1965, were selected from this longitudinal sample of 1,600 students. Data were retained only for those students for whom achievement scores were reported in both 1974 and 1979 and for whom complete demographic information regarding

" . . . although conclusions will not necessarily generalize to the larger Annual Survey population, they are applicable to a large group of special education students . . . . "

sex, degree of hearing loss, educational program placement, ethnic group status, and other handicapping conditions was reported to the Annual Survey of Hearing-Impaired Children and Youth. Most importantly, only those students for whom specific causes of deafness were reported were kept in the sample; students with unknown or unreported causes were excluded from the sample. This procedure was adopted in order to permit a clear contrast with respect to cause.

The resulting sample consisted of 330 students who were 8–9 years old when tested in 1974, and 13–14 when tested in 1979. The sample has representation from 21 different states. A summary of the characteristics of the sample as compared to all 53,306 hearing-impaired students reported to the 1978–79 Annual Survey of Hearing-Impaired Children and Youth is given in Table 1.

It is clear that the sample is not representative of the entire group of students receiving special educational services because of their hearing loss; as expected, nearly twice the proportion of students in the sample report maternal rubella as the cause of hearing loss than do the students from the Annual Survey population. In addition, the sample contains a larger proportion of minority students and students with profound hearing losses; and smaller proportions of male students, students with additional handicaps, and students who were enrolled in part-time special education programs.

The lack of representativeness of the current sample to the larger Annual Survey population is not as troublesome as it might first appear, in light of the overall intent of the current study, which is to provide some useful information appropriate to students likely to attend postsecondary education programs for deaf students. The nonrepresentativeness can be attributed directly to the limitations involved in choosing the sample, which called for students who were born during a one-year period, who were administered achievement tests in both 1974 and 1979, and who were enrolled in the same special education program during the 1974 to 1979 interval. Students in the sample were, by definition, academically stable in terms of program assignment and had sufficient academic skills to be eligible for achievement testing. Thus, although conclusions will not necessarily generalize to the larger Annual Survey population, they are applicable to a large group of special education students who are soon likely to apply to postsecondary education programs.

Table 1

Comparison of Sample with Annual Survey Population on Variables Included in the Path Model

Demographic Variables	Current Sample $n = 330$	Annual Survey Population (1978–79 School Year) N = 53,306
Minority Status (Proportion reported to be non-white)	.42	.28
Rubella Status (Proportion with cause of loss reported to be due to maternal rubella)	.60	.32
Sex (Proportion who are male)	.48	.54
Presence of Additional Handicaps (Proportion reported having additional handicapping conditions)	.22	.27
Degree of Hearing Loss (Proportion having > 90 dB, ISO, threshold in better ear)	.62	.44
Placement in Part-time Special Education (Proportion attending part-time special education programs from 1974–1979)	.15	.31

Note. These proportions are calculated on the group of students for whom data are reported and not on the total number.

Step 3: Specification of the Model

In the analysis of the reading and math achievement scores of hearing-impaired students, there has been little *theoretical* speculation into the causal relationships among the variables discussed here. However, a wealth of *descriptive* research has resulted from the Annual Survey of Hearing-Impaired Children and Youth, and from four national achievement test programs conducted by the Office of Demographic Studies, which has explored bivariate relationships among these variables.

" . . . it is often difficult to make a firm prediction for a given bivariate relationship."

In specifying the model, this body of research will be relied upon to derive predictions. There appear to be no published studies that have explored the observed bivariate relationships in terms of the three types of effects discussed above. The authors will tentatively specify a model in which paths are left in where prior research has shown that relationships exist between the variables in question.

Two different models will be tested using path analysis, one for each of two different achievement areas—reading comprehension and mathematics computation. Prior variables in the model have been shown to have different relationships with each of these achievement areas.

Arrangement of Variables in Temporal Order

Using this overall schema (i.e., that the identifying conditions give rise to handicapping conditions which, in turn, influence educational outcomes) it is necessary to place the specific variables in temporal order within their general categories. By definition, identifying variables cannot be temporally ordered. Sex, minority status, and rubella status are predetermined as far as this model is concerned. In path analytic terms these variables are called *exogenous* variables; their causal interrelationships are indeterminate. It may be that rubella status covaries with sex or minority status, but it is impossible to infer any causal direction from that covariance. One cannot explain the correlations among these exogenous variables in terms of direct, indirect, and spurious effects. (In the pictorial representation of the model, the relationship among the exogenous variables will be represented with curved lines.)

The remaining variables in the model are called *endogenous*, which means they are causally determined by variables that occur prior in the model. Considering the two handicapping variables, it is more likely that the presence of additional handicapping conditions impacts upon the degree of hearing loss than that the converse is true. Thus the presence of additional handicaps is placed prior to the degree of hearing loss in the model.

Finally, the three educational variables are placed in the following order: (1) 1974 achievement level, (2) placement in part-time special education programs, and (3) 1979 achievement level. The program enrollment variable is placed between the two achievement assessments because the measure of participation in part-time special education identifies only students who were presumed to be in such programs throughout the entire five-year interval. Thus, it is assumed that 1974 achievement affects a student's ability to stay in the mainstream. This, in turn, affects the subsequent 1979 achievement level.

Path Relationships among the Variables

This section summarizes what is known about the bivariate relationships between the variables under consideration as a basis for constructing the path models. The studies cited below are the work of the Office of Demographic Studies, using data from its Annual Survey of Hearing-Impaired Children and Youth and several national achievement test programs.

The sample of 330 students whose data are used to test the proposed models is a subgroup of a much larger number of special education hearing-impaired students who are reported to the Annual Survey of Hearing-Impaired Children and Youth. However, as previously discussed the sample is not altogether representative of the larger group primarily because of the procedures used to select the sample. For those instances when the nature of the present sample would clearly indicate different bivariate relationships from those observed with the Annual Survey data, the different expectations are noted.

In addition, it is often difficult to to make a firm prediction for a given bivariate relationship. The studies reviewed are, by and large, descriptive, and the issue of whether or not observed differences in proportion are significant is rarely addressed in the articles cited. It is therefore difficult to assess, in some instances, what constitutes an interpretable difference.

Table 2 describes previous findings regarding the individual bivariate relationships of the variables making up the proposed models; the anticipated path directions are also shown. Figures 2 and 3 summarize the proposed models for reading comprehension and math computation, respectively. These are the models that will be tested in Step 4.

Assessment of the Limitations of the Proposed Model

One limitation, already discussed, pertains to the composition of the sample; this restricts the ability to generalize the results. Other limitations relate to the specifications of the model and the possible correlation of error variance. A large amount of residual variation (variance of a variable not explained by its predictors) is to be expected, especially with the 1974 achievement level. The 1979 achievement level should be largely predictable from the 1974 achievement level and

Table 2

Summary of Anticipated Path Relationships

Anticipated Path	Source	Comments
Rubella Status ⁻ Minority Status	Ries, Bateman, & Schildroth (1975)	Black students slightly less likely to have maternal rubella as cause than whites; not true for other minorities.
Rubella Status ⁻ Sex (being male)	Trybus, Karchmer, Kerstetter, & Hicks (1980) Gentile & Rambin (1973)	Group of students with maternal rubella as cause made up of slightly higher percentage of females than group otherwise caused.
Rubella Status $\xrightarrow{+}$ Presence of Additional Handicaps	Trybus et al. (1980)	Maternal rubella associated with higher likelihood of additional handicaps, particularly visual problems, heart disorders, and emotional-behavioral problems.
Rubella Status $\xrightarrow{+}$ Degree of Hearing Loss	Trybus et al. (1980)	Slightly greater proportion of profound deafness among maternal-rubella cases.
Rubella Status $\xrightarrow{-}$ Placement in Part-time Special Education	Trybus et al. (1980)	Maternal-rubella individuals relatively more likely to attend special schools for the deaf.
Rubella Status $\xrightarrow{?}$ 1974 Achievement Level (a) Rubella Status $\xrightarrow{?}$ Reading Comprehension (b) Rubella Status $\xrightarrow{?}$ Math Computation	Jensema (1975)	No strong bivariate relationship between rubella status and reading and math achievement has thus far been reported.
Rubella Status $\xrightarrow{?}$ 1979 Achievement Level	—	Effect unknown, but significant finding would imply a growth effect since 1974 achievement level is accounted for in the model.
Minority Status ⁰ Sex	Ries et al. (1975)	Slightly greater proportion of males in all ethnic groups.
Minority Status $\xrightarrow{0}$ Presence of Additional Handicaps	Ries et al. (1975)	Black students more likely than whites to be mentally retarded, but this may not be a factor for present study, because MR students are less likely to be given achievement tests. Also, Hispanic students less likely to have reported additional handicaps.

Table 2 (continued)

Anticipated Path	Source	Comments
Minority Status —Ø→ Degree of Hearing Loss	Ries et al. (1975) Karchmer, Milone, & Wolk (1979)	Hearing level differences for different ethnic groups small.
Minority Status —−→ Placement in Part-time Special Education	Karchmer & Trybus (1977) Ries et al. (1975)	Minority students less likely to be mainstreamed; blacks and Hispanics more likely than whites to be in day schools for the deaf.
Minority Status —−→ 1974 Achievement Level (a) Minority Status —−→ Reading Comprehension (b) Minority Status —−→ Math Computation	Trybus & Karchmer (1977) Jensema (1975)	Whites outperform minority students on reading and math tests.
Minority Status —− or ?→ 1979 Achievement Level	Trybus & Karchmer (1977) Rawlings & Allen (1980)	Conflicting evidence: no difference in achievement gain for whites and minorities reported for national sample by Trybus & Karchmer, but more recent results from statewide testing in Texas found blacks gained less than whites (Rawlings & Allen).
Sex (Male) —Ø→ Presence of Additional Handicaps	Gentile & McCarthy (1973)	Females less likely to be additionally handicapped by slight amount; since present sample is small and multihandicapped students are underrepresented in sample, no relationship should be evident.
Sex (Male) —+→ Degree of Hearing Loss	Karchmer, Milone, & Wolk (1979)	More males have profound losses than females; small effect.
Sex (Male) —Ø→ Placement in Part-time Special Education	—	No significant relationship expected.
Sex (Male) —−→ 1974 Achievement Level (a) Sex (Male) —−→ Reading Comprehension (b) Sex (Male) —Ø→ Math Computation	Jensema (1975) Trybus & Karchmer (1977)	Females outscore males on reading comprehension, but not on math computation.
Sex (Male) —Ø or ?→ 1979 Achievement Level	Trybus & Karchmer (1977)	No difference on achievement gain reported for reading; math not yet studied.
Presence of Additional Handicaps —Ø→ Degree of Hearing Loss	Karchmer, Milone, & Wolk (1979)	Additionally handicapped students less likely to be profoundly impaired by small degree; sample's exclusion of multihandicapped students makes expected relationship unclear.

Table 2 (continued)

Anticipated Path		Source	Comments
Presence of Additional Handicaps	(−) Placement in Part-time Special Education	Gentile & McCarthy (1973)	Students with additional handicaps less likely to be partially mainstreamed.
Presence of Additional Handicaps	1974 Achievement Level	Jensema (1975) Trybus & Karchmer (1977)	Presence of other handicaps associated wtih lower reading and math achievement.
(a) Presence of Additional Handicaps	(−) Reading Comprehension		
(b) Presence of Additional Handicaps	(−) Math Computation		
Presence of Additional Handicaps	1979 Achievement Level	Trybus & Karchmer (1977)	Students without other handicaps gained more on reading over 3-year period; math gain differences not yet studied.
(a) Presence of Additional Handicaps	(−) Reading Comprehension		
(b) Presence of Additional Handicaps	(?) Math Computation		
Degree of Hearing Loss	(−) Placement in Part-time Special Education	Karchmer & Trybus (1977) Karchmer, Milone, & Wolk (1979)	Profoundly deaf students less likely to be mainstreamed than students with less severe losses.
Degree of Hearing Loss	1974 Achievement Level	Jensema (1975) Trybus & Karchmer (1977)	The greater the hearing loss the lower the average reading level for a given age; no overall differences on math by hearing level.
(a) Hearing Loss	(−) Reading Comprehension		
(b) Hearing Loss	(∅) Math Computation		
Degree of Hearing Loss	1979 Achievement Level	Trybus & Karchmer (1977)	Students with less than 55 dB loss gained more over 3-year period for reading; effect not yet studied for math, but no difference expected.
(a) Degree of Hearing Loss	(−) Reading Comprehension		
(b) Degree of Hearing Loss	(∅) Math Computation		
1974 Achievement Level	(+) Placement in Part-time Special Education	Jensema (1975)	Students in part-time programs, on average, perform better than those in full-time special education for math and reading.
1974 Achievement Level	(+) 1979 Achievement Level	—	Should be highly correlated.
Placement in Part-time Special Education	(?) 1979 Achievement Level	—	Effects of continued mainstreaming on gain not yet reported.

" . . . students with a profound hearing loss may misinterpret test instructions . . . . This would result in . . . misleading correlations between degree of hearing loss and achievement level."

therefore should have a small amount of residual variation. Clearly, many variables not included in the model affect achievement level and growth. These may be factors not related to deafness, such as innate ability or quality of instruction. They may be deafness-related factors, such as the hearing status of the student's parents. Additionally, test measure factors may influence the results: an observed high correlation between 1974 and 1979 achievement levels may be a correlation of the error variance inherent in the two administrations of the same test. Indeed, the regression approach to path analysis used here requires the assumption that no such correlated error variance exists. A particular danger is that this correlated error variance may itself correlate with other variables in the model. For example, students with a profound hearing loss may misinterpret test instructions on both test administrations. This would result in misleadingly high correlations between 1974 and 1979 achievement levels, as well as misleading correlations between degree of hearing loss and achievement level. Conclusions need to be drawn carefully.

Step 4: Testing the Model

Correlation matrices of the sets of variables used in the current analysis appear in Table 3 (reading comprehension scores) and in Table 4 (math computation scores). The correlations, by themselves, show the degree to which the bivariate relationships presented in Table 2 are confirmed. In studying the path coefficients, which represent direct effects, it is often interesting to compare their magnitude with the correlations. The extent to which the path coefficients are of lesser or great magnitude than the correlations for given variable pairs indicates the degree to which spurious and indirect effects comprise the observed bivariate relationship. The re-

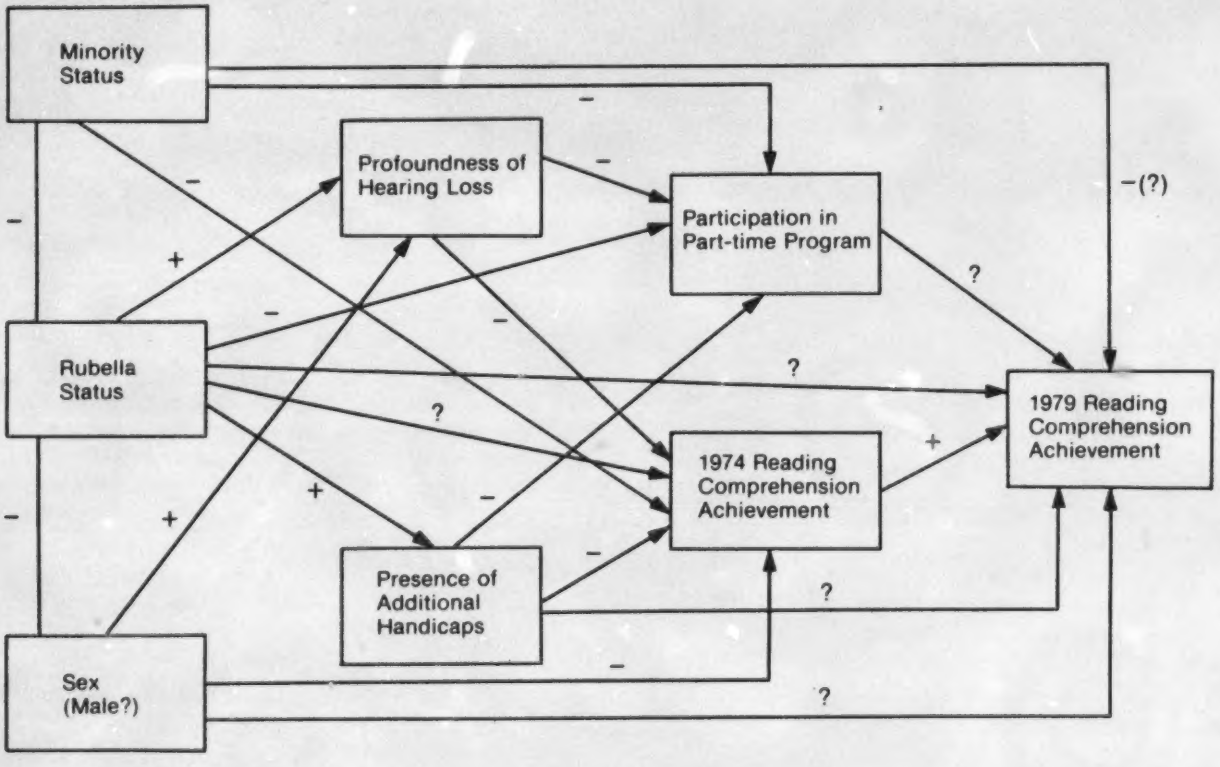


Figure 2
Predicted Reading Comprehension Model

" . . . rubella status has only one direct effect, on the degree of hearing loss."

sults of the path analyses appear in Figure 4 (reading comprehension) and in Figure 5 (math computation). The numbers adjacent to the paths are the path coefficients. In the discussion of results, each variable in the model is considered (starting with the exogenous and working toward 1979 achievement) and its impact on all the subsequent variables in the model is discussed.

Rubella Status

Tables 3 and 4 reveal that the correlations between rubella status and all other variables are weak and mostly nonsignificant. As predicted, hearing-impaired persons with maternal rubella as their reported cause are slightly less likely to be members of a minority group. For this sample, students whose deafness was caused by maternal rubella are somewhat less likely to have profound hearing loss. The sample, as noted before, differs in this respect from the entire special education population. Also, the anticipated relationship between rubella status and additional handicaps was not borne out in the present sample.

The path models reveal that rubella status has only one direct effect, on the degree of hearing loss. Since persons with profound hearing losses are not as likely to be enrolled in part-time special education programs (instead of full-time) and are less likely to score well on the 1979 reading comprehension test, it may be noted that rubella status has an indirect effect on both of those subsequent variables. However, since the rubella-caused students in this sample are less likely to have profound hearing losses, one might be tempted to conclude that, as a group, their achievement scores should be higher. The path coefficients are not large, however, and the combined effect of rubella status and profound hearing loss on subsequent variables in the model is very small.

The significant negative correla-

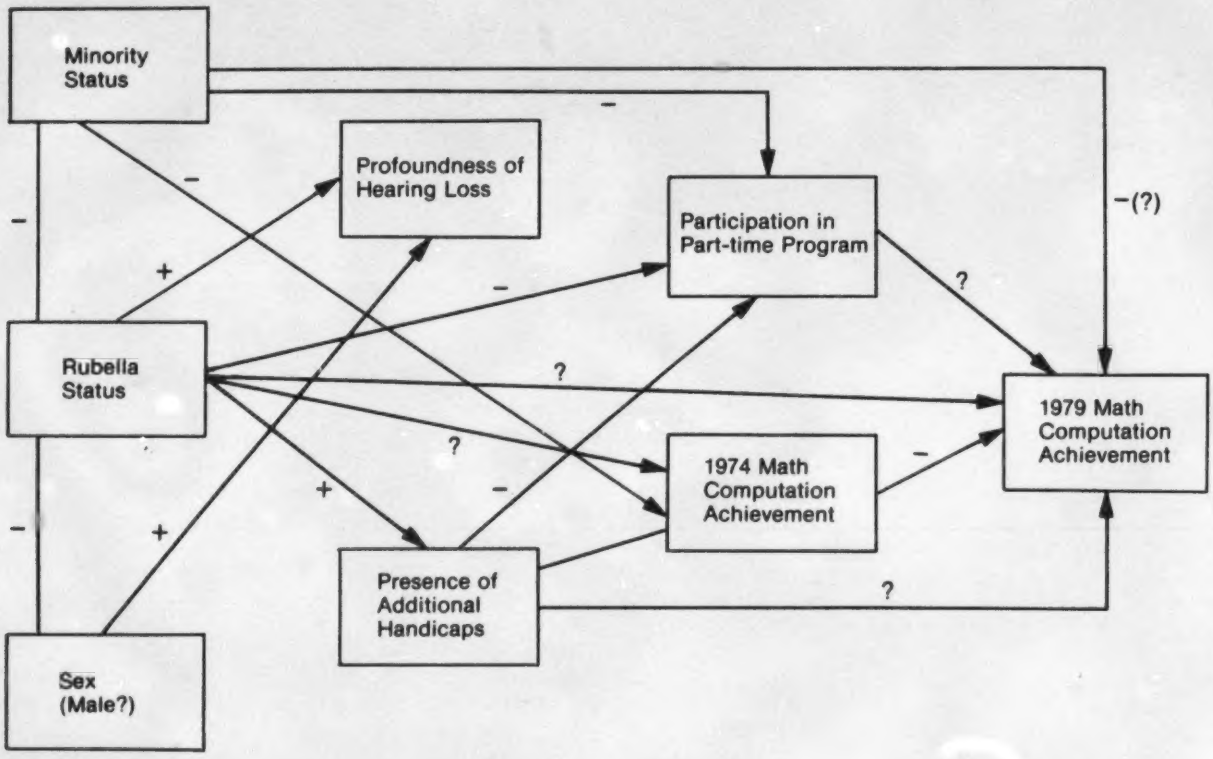


Figure 3
Predicted Math Computation Model

" . . . a student's minority status affects achievement growth as well as the initial achievement level."

Table 3

Correlation Matrix for Variables Included in the Reading Comprehension Model
$n = 330$

	Rubella Status	Minority Status	Sex (Male)	Additional Handicaps	Degree of Loss	1974 Reading Comprehension	Part-time Programs
Minority Status	−.12*						
Sex (Male)	.05	.10*					
Additional Handicaps	.06	−.06	.01				
Degree of Loss	−.12*	−.04	.07	.00			
1974 Reading Comprehension	.03	−.33***	−.14**	−.08	−.02		
Part-time Programs	−.02	−.13*	−.04	−.06	−.15**	.30***	
1979 Reading Comprehension	−.01	−.43***	−.16**	−.11*	−.12*	.72***	.30***

Note. * $p < .05$
** $p < .01$
*** $p < .001$

tion between rubella status and minority status and the sizable negative direct effects of minority status on both 1974 and 1979 achievement levels indicate that some of the effects of rubella-caused deafness on achievement level can be accounted for by minority status. Again, however, the size of the combined effect is small.

Minority Status

This variable showed the predicted significant negative correlations with 1974 achievement level, with placement in part-time programs and with 1979 achievement levels. An unanticipated positive correlation between minority status and sex was also found for this sample.

In the path models, two direct effects can be noted for each subject area—on both 1974 and 1979 achievement. Given that minority status has a significant direct negative effect on 1979 achievement, it may be concluded that a student's minority status affects achievement growth as well as the initial achievement level.

Minority status indirectly affects 1979 achievement level through its effect on 1974 achievement level (both reading and math), and it indirectly affects placement in part-time special education programs, also through 1974 achievement level.

Sex

Sex showed a significant direct effect on 1974 reading comprehension achievement and a direct positive effect on degree of hearing loss for the math computation model. These two direct effects result in some observed indirect effects. Sex indirectly affects placement in part-time special education and 1979 reading comprehension through its direct effect on 1974 achievement level. Males, who are less likely to do well on 1974 reading comprehension achievement, are thus less likely to be partially mainstreamed and less likely to score well on reading comprehension in 1979, even though there is no direct effect of sex on these two variables. In the model represented in Figure 5, sex indirectly affects placement in part-time programs through its small positive effect on degree of hearing loss. (This relationship does not occur in the reading comprehension model due to small differences in the sample.)

Presence of Additional Handicaps

For the reading comprehension model the presence of additional handicaps has a direct negative effect on 1979 achievement level, but no indirect or spurious effects can be noted. That is, its effect on 1979 achievement is independent of all of the other variables in the model. The anticipated effect on 1974 reading achievement did not occur.

The presence of additional handicaps has a strong negative direct effect on 1974 math achievement. This yields indirect effects on both part-time placement and 1979 achievement. Students with additional handicaps did more poorly on 1979

"In the analysis of the math computation model, degree of loss has only one direct effect—on participation in part-time programs."

Table 4

Correlation Matrix for Variables Included in the Math Computation Model
***n* = 313**

	Rubella Status	Minority Status	Sex (Male)	Additional Handicaps	Degree of Loss	1974 Math Computation	Placement in Part-time Special Ed.
Minority Status	.11*						
Sex (Male)	.03	.11*					
Additional Handicaps	.04	−.08	.01				
Degree of Loss	−.13*	−.02	.12*	.01			
1974 Math Computation Achievement	−.05	−.31***	−.12*	−.22***	−.08		
Placement in Part-time Special Ed.	−.03	−.12*	−.04	−.08	−.16**	.33***	
1979 Math Computation Achievement Level	.03	−.36***	−.15**	−.16**	−.09*	.61***	.18***

Note. * $p < .05$
** $p < .01$
*** $p < .001$

mathematics computation and were less likely to be enrolled in part-time special education, in part because they had lower achievement levels in 1974.

Degree of Hearing Loss

In the analysis of the reading comprehension model, degree of hearing loss has direct effects on special education placement and on 1979 achievement level. Interestingly, it does not directly affect 1979 achievement, and so fails to confirm the prediction that it would. In the analysis of the math computation model, degree of loss has only one direct effect—on participation in part-time programs.

The prediction that students with profound hearing losses would be less apt to be mainstreamed was supported in the current findings. However, in neither the reading nor math models did degree of hearing loss significantly affect 1974 achievement. For the reading comprehension model, degree of loss did affect the 1979 achievement level. Thus it might be concluded that hearing loss has an impact on achievement gain for the students in the sample.

1974 Achievement

For both mathematics computation and reading comprehension, the 1974 achievement level has significant positive correlations with both participation in part-time special education and the 1979 achievement level. In the path analyses, these correlations appear as positive direct effects. Given no direct effect of participation in part-time programs on 1979 achievement level, there is no evidence for an indirect effect of 1974 achievement on 1979 achievement through the mediating variable. Some of the correlation between 1974 and 1979 achievement levels results from spurious sources, especially minority status, which has strong direct effects on achievement levels at both points in time and in both subject areas. These findings support the predicted relationships.

Placement in Part-time Special Education

Despite highly significant positive bivariate correlations between placement in part-time special education and the 1979 achievement level in both subject areas, neither model reveals a significant path leading from program placement to 1979 achievement level. Since there are no mediating variables in the models, the correlations can be attributed to spurious sources. As implied by the reading comprehension model, students in part-time programs did better on 1979 achievement primarily because they had less profound hear-

" . . . maternal rubella showed a slight negative relationship with degree of loss."

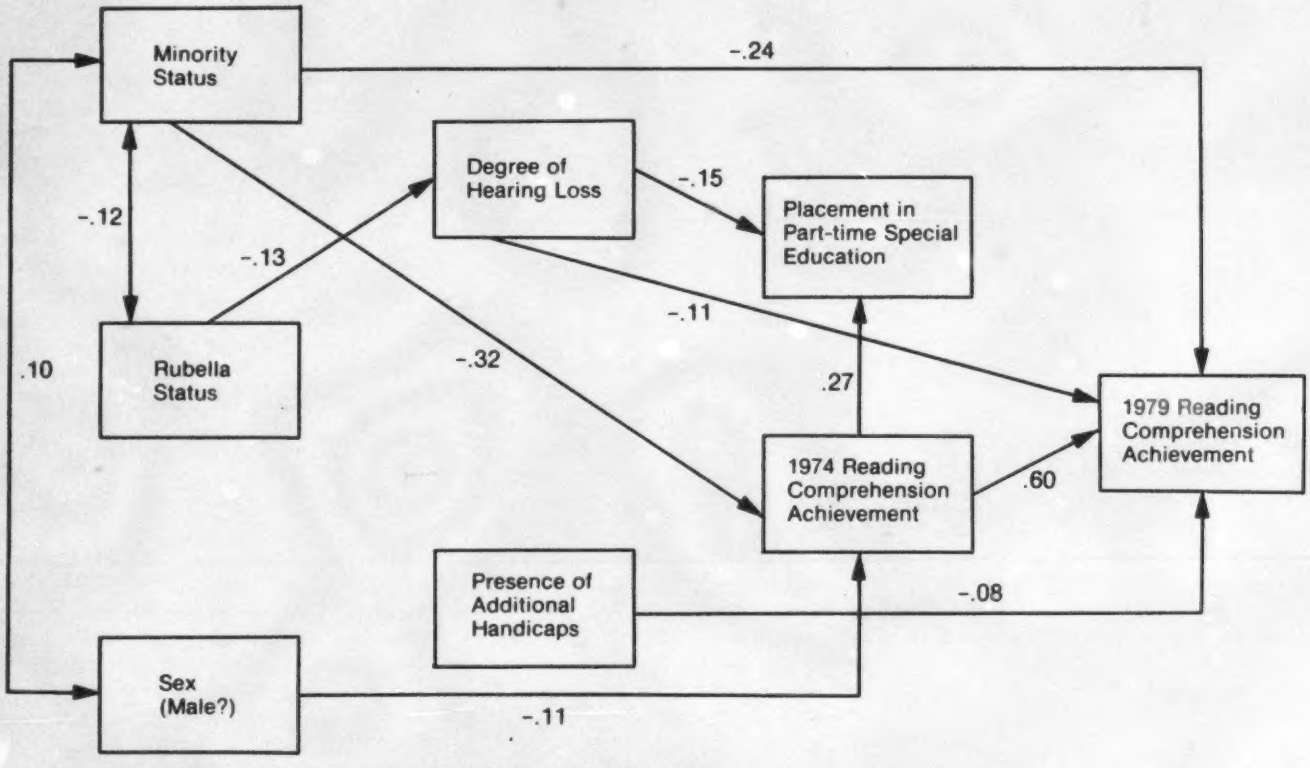
ing losses and had higher 1974 reading comprehension achievement levels. In the math computation model, the path leading from level of hearing loss to 1979 achievement is not significant. Thus, partially mainstreamed students did better in 1979 math computation primarily because they did well in 1974.

Discussion

Among the students in the sample studied, rubella status was a very weak predictor of all the other variables in the two achievement models. Surprisingly, the group for whom maternal rubella was reported as the cause of deafness did not show a significantly greater proportion of additional handicaps or profound hearing loss than did the group for whom the known cause was not maternal rubella. In fact, maternal rubella showed a slight negative relationship with degree of loss.

For this sample, knowledge that a person's deafness resulted from maternal rubella does not therefore tell much about the likelihood that the student will (a) have additional handicapping conditions, (b) will have a profound hearing loss, or (c) will participate in a part-time special education program instead of a full-time program. Nor will it lead to any conclusions about the level of achievement.

This conclusion must be qualified with a reiteration of the composition of the sample, which is comprised of students born in a one-year time period (September 1964 through August 1965) who were selected for achievement testing in 1974 and 1979. Table 1 shows that this sample differs from the large population from which it is drawn. Though re-



Note. All path coefficients are significant at the .05 level of significance.

Figure 4
Resulting Reading Comprehension Path Model

" . . . it is probable that the effects of minority status per se on the other variables would have been greatly reduced . . . . "

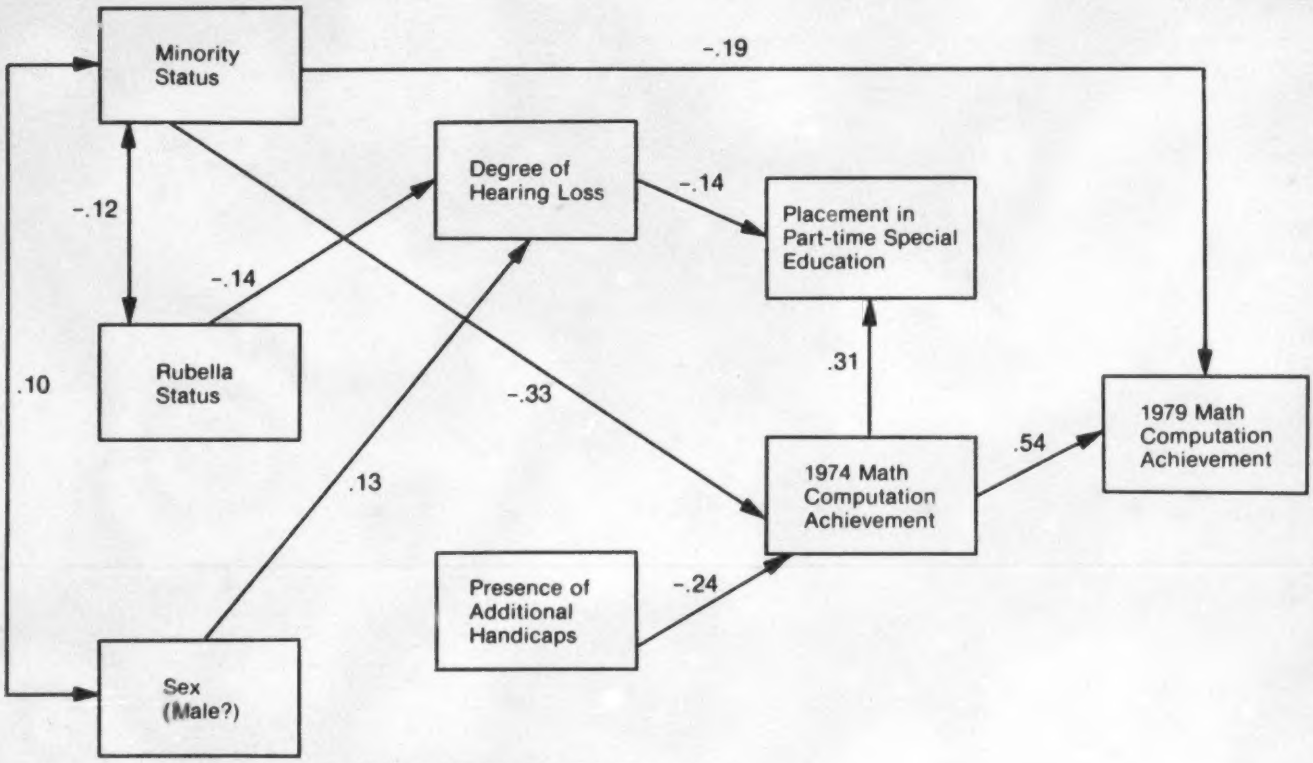
stricting the ability to generalize the findings, it does not negate them. Students who were born during the peak year of the rubella epidemic and who have been involved in special education settings in which achievement tests have been a part of the curriculum are an important sample of students to study, especially now, as these students are reaching postsecondary education age. It is to these students that the conclusions of this study pertain.

It is important to say that the results of the study do not bear directly on the issue of whether rubella-caused deaf students will attend postsecondary education programs in proportion to their numbers. What this study does attempt to do is isolate this cause as a factor related to academic achievement for special education students in comparable kinds of programs.

Since the initial aim of this study was to focus on maternal rubella and its relationship to achievement, the other findings of the path analyses are discussed here only briefly. They do suggest directions for future research.

By and large, minority status influenced the subsequent variables in the model in ways that were predicted. It should be kept in mind that minority status is inseparable from socioeconomic status, for which no direct measures were included in the models tested. Had appropriate socioeconomic indicators been incorporated into the models, it is probable that the effects of minority status *per se* on the other variables would have been greatly reduced and that the relationship between minority status and socioeconomic status would have been very high.

Most interesting in the current



Note. All path coefficients are significant at the .05 level of significance.

Figure 5
Resulting Math Computation Path Model

" . . . the highly significant correlation between part-time special education status and the 1979 achievement level . . . is attributable to degree of loss and the 1974 achievement level."

findings is the fact that minority status maintained fairly strong effects on 1979 achievement levels in both math and reading even when 1974 achievement levels are included in the model. The findings imply that academic growth between the ages of 9 and 14 is not as fast for minority students as it is for white students. The effect of minority status on enrollment in part-time special education is not direct. Minority students are less likely to attend part-time programs, but this fact is understandable in terms of the students' 1974 achievement levels.

Sex had very little impact on the subsequent variables in the model. With respect to achievement, the analysis confirmed the prediction that males would do somewhat more poorly on reading comprehension than would females, but that this relationship would not hold true for math computation. Sex did have an impact on 1974 achievement levels, indicating that sex does not affect achievement gain.

As regards presence of additional handicaps, the most interesting finding is that it has an effect on 1974 math computation, but not on 1974 reading comprehension. Its effect on 1979 math computation and on part-time placement is indirect through 1974 math computation. It is not possible to speculate at this point why the presence of additional handicaps has an impact on math computation achievement level and not on reading comprehension level. Further study using other samples of students is certainly warranted.

Degree of hearing loss shows interesting and somewhat perplexing relationships to the achievement measures used in the current study: it directly affects both reading comprehension and math computation 1979 achievement levels, i.e., achievement growth, but neither of the 1974 measures. The failure to find a significant relationship with 1974 achievement levels may reflect the homogeneity of the sample.

The last finding, which is especially interesting in the current analysis, is the lack of a direct effect of special education program placement on the 1979 achievement level. In the current data, the highly significant correlation between part-time special education status and the 1979 achievement level is spurious, and is attributable to prior variables; more specifically, it is attributable to degree of loss and the 1974 achievement level. This finding has implications for mainstreaming. Students in part-time programs do achieve at higher levels for both the reading and math areas, but this fact cannot be attributed to program characteristics, at least in the present set of data. It is related to the characteristics of the students, namely, the severity of their handicap and their prior achievement level. This conclusion is descriptive, not prescriptive. It remains to be seen whether students with lower achievement levels and more severe losses would profit by participating in part-time, rather than full-time special education programs. The current data merely show that these lower achieving and profoundly deaf students typically have not been involved in part-time programs, rendering the efficacy of mainstreaming still an open question.

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The 1963-65 Rubella Epidemic: Impacts on Postsecondary Education of a Large Population of Deaf Adolescents

Philip P. Kerstetter
David F. Armstrong

Rubella, more commonly known as German measles, is a relatively common infectious disease associated with childhood. Most people who contract it experience few, if any, lasting effects. Although the effect of the virus on a child or an adult is usually minimal, its impact on a developing fetus can be extensive. When the disease occurs during the first trimester of pregnancy, cell development in the sensory systems may be retarded, resulting in hearing and/or visual impairments, as well as other developmental problems (Vernon & Hicks, 1980).

Rubella epidemics tend to occur in the spring in six to nine year cycles, and the 1963-65 epidemic was a particularly severe one based on the number of reported cases (Stuckless, 1980). It is estimated that in the United States an additional 8,000 individuals were born deaf and 3,600 individuals were born deaf-blind as a result of maternal rubella (Trybus, Karchmer, Kerstetter, & Hicks, 1980). This represents a sizable increase in the number of deaf and deaf-blind students in the United States educational systems: whereas there are annually about 3,500 nineteen-year-old deaf persons enrolled in secondary education programs, this number will increase by 170% to 9,500 in 1983 and by 85% to 6,500 in 1984 before it levels out during the several succeeding years. These students will begin to have an impact on higher education institutions in the fall of 1982. By 1984, enrollment of hearing-impaired students in postsecondary programs will increase by more than 50% over current levels.

This paper was originally presented in somewhat different form at the 16th Annual International Conference of the Society for College and University Planning.

The National Center for Education Statistics estimates that approximately 12,000 hearing-impaired students were enrolled in postsecondary education institutions in 1978 (Wulfsberg & Petersen, 1979). Currently, there are approximately 4,500 hearing-impaired students enrolled in the more than 50 postsecondary institutions which have formal educational programs for the hearing impaired throughout the United States and Canada (Rawlings, Trybus, & Biser, 1981). Although nearly half of this latter number are enrolled in two national programs (Gallaudet College and the National Technical Institute for the Deaf) or four regional programs (Seattle Community College, California State University at Northridge, St. Paul Technical-Vocational Institute, and Delgado Vocational-Technical Junior College), it is unlikely that these programs will be able to accommodate the full projected increase. Therefore, it is anticipated that many of these students will seek admission at other postsecondary institutions, especially local community colleges, under Section 504 of the Rehabilitation Act of 1973.

Size and Characteristics of the Rubella Population

Each year since 1968, the Office of Demographic Studies (ODS) at Gallaudet College has conducted an annual survey of hearing-impaired children and youth enrolled in special education programs in the United States. During the 1972-73 academic year, specific questions were asked in the survey to determine cause of deafness, age of onset of deafness, and additional handicapping conditions. The impact of the 1963-65 epidemic and, to a lesser extent, the 1958-59 epidemic is evident in Table 1 through the significant increases in both numbers of cases and percentages of persons reporting rubella as the identified cause of deafness. The data indicate that almost half of the hearing-impaired students born during the 1963-65 epidemic period had hearing losses as a result of maternal rubella. During other times, this percentage is much lower, closely resembling the 9% identified by Vernon (1967) in an earlier study.

While the size of the group has presented problems to institutions and agencies, there is a body of literature which suggests that this group may be quite different from other groups of hearing-impaired children. An early study of a group of rubella children at the California School for the Deaf at Riverside concluded that there was a tendency for intelligence level scores to cluster towards the lower end of the scales (Vernon, 1967). More recent studies have been somewhat more optimistic. In a small group study involving matched pairs of rubella and non-rubella hearing-impaired children, Jones (1976) found no significant difference in educational performance; data obtained by Jensema (1975) were in agreement.

There is, however, a higher rate of additional handicapping conditions when maternal rubella is identified as the etiology of deafness. The percentage of involvement ranges from 34% (Jensema, 1974) to 54% (Vernon, 1967), and both studies noted high percentages of aphasia or emotional disorders. More recent studies by the Office of Demographic Studies at Gallaudet College noted that 37% of all rubella-deafened children have one or more educationally significant additional handicapping conditions compared with a rate of 25% for

"Rubella tends to affect developing male and female fetuses equally . . . ."

Table 1

Enrollment in Educational Programs for the Deaf by Year of Birth (1972–73 Academic Year)

Year of Birth	Total Number of Students	Percentage Reporting Rubella as Cause of Deafness
Before 1954	1,205	7
1954	1,502	3
1955	1,928	2
1956	2,222	5
1957	2,413	9
1958[a]	3,504[a]	16[a]
1959[a]	3,098[a]	13[a]
1960	2,678	8
1961	2,471	5
1962	2,411	6
1963	2,589	10
1964[b]	6,329[b]	44[b]
1965[b]	4,034[b]	37[b]
1966	2,341	21
1967 and after	4,821	16
Unknown	331	11
Totals	43,946	18

Note. From "Onset, cause, and additional handicaps in hearing impaired children" by C. Jensema and J. Mullins, *American Annals of the Deaf*, 1974, *119*(6), 703. These statistics do not represent current estimates of the population. See Tables 7 and 8.

[a] 1958–59 rubella epidemic

[b] 1963–65 rubella epidemic

children with other etiologies. The most prevalent additional handicaps were visual problems, heart disorders, mental retardation, and emotional/behavioral problems (Trybus, Karchmer, Kerstetter, & Hicks, 1980). High incidence rates of emotional/behavioral problems were also identified by Jensema and Trybus (1975) and most recently by Chess and Fernandez (1980).

During nonepidemic periods of rubella, heredity and prematurity account for most of the reported causes of deafness. As both of these causes tend to affect males more than females, there is a higher percentage of hearing-impaired males (55%) than females (45%) in the general population of hearing-impaired persons. Rubella tends to affect developing male and female fetuses equally, and the distribution of hearing-impaired males and females deafened by maternal rubella is equal (Trybus, Karchmer, Kerstetter, & Hicks, 1980).

In order to make adequate preparations for the potential influx of new students in the 1980s at Gallaudet College, an institutional research project was undertaken to address the following questions.

1. Does the etiology of deafness affect acceptance into the institution?
2. Does the etiology of deafness affect the distribution of sexes on campus?
3. Does the etiology of deafness affect the numbers of students with additional handicapping conditions?
4. Does the etiology of deafness affect progression within the institution?

The answers to these questions have implications for all institutions of higher education which enroll hearing-impaired students.

Project Methods

Students at Gallaudet College who were born prior to and during the previous, less severe rubella epidemic (1958–59) and who were deafened by maternal rubella were compared with those students born during the same period who had other etiologies of deafness. Applications and transcripts for students who were born in 1957, 1958, or 1959 and who sought admission to Gallaudet College for the academic years 1977, 1978, 1979, or 1980 were examined.

Some students had applied more than once to the institution. For those students who never enrolled, information was used from the first application form; for those students who eventually matriculated, information was used from the most recent application form.

Project Results

A total of 1,949 hearing-impaired students born during 1957–1959 sought admission to Gallaudet College during the years 1977–80. Approximately one-half (51.5%) of all applicants were not accepted; slightly more than one-quarter (28.9%) of applicants eventually matriculated at the institution. This closely fol-

"The rubella group has an additional handicapping rate of 11.8% compared to a rate of 5.9% for the nonrubella group."

lows the institutional pattern of previous years at Gallaudet College. Concerning the cause of their deafness, 184 (9.5%) of the applicants reported the etiology of their deafness as rubella, 127 (6.5%) reported hereditary deafness, 721 (37.0%) reported some other specified cause, and 917 (47.0%) indicated cause unknown.

Matriculation Rate for Rubella-Deafened Students Compared with the Matriculation Rate for the General Population Pool

Table 2 presents a comparison of the percentage of rubella-deafened students, by year of birth, with the pool of hearing-impaired students in the general population, by year of birth.

The rubella group tends to be slightly under-represented as a proportion of the population of all applicants to Gallaudet College, but it is slightly over-represented as a proportion of matriculated students. This may be due to the fact that the distribution of achievement test scores for rubella students is more positively skewed. While there are fewer applicants to Gallaudet, they are clustered in the group that tends to be accepted into the college.

Table 2

Matriculation Rate of Rubella Students at Gallaudet College

Year of Birth	Percentage of Hearing-Impaired Population	Percentage of of all Gallaudet Applicants	Percentage of Enrolled Students
1957	9	6.3	12.5
1958	16	13.0	19.8
1959	13	7.4	9.1

Age at Entry

Most children with deafness caused by maternal rubella are born in the late fall and early winter. Table 3 compares the ages of incoming Gallaudet students by cause of deafness. There are no significant differences in the age of entering students when examined by etiology. Although the rubella students tend to be slightly older, this is most likely due to the relationship between the month of their birth late in the year and the variety in state educational policies regarding acceptance into school systems.

Sex Distribution

The impact of rubella on the distribution of sexes in the student population at Gallaudet is presented in Figure 1. The first two columns show the sex distribution of the student body when rubella is reported as the cause of deafness. The latter two columns show the distribution when rubella is not reported as the cause. The high rate of females in contrast to the distribution in the general hearing-impaired population can probably be explained by the higher attraction among females to the traditional liberal arts academic program at Gallaudet College. For students with rubella as the reported cause of deafness, this contrast is even more evident due to the equal impact of rubella on both sexes. This could be an important factor for those institutions which have residential components.

Table 3

Mean Age of Entry of Gallaudet College Students by Cause of Deafness

Cause of Deafness	Mean Age	Standard Deviation
Rubella Reported	19.83	.98
Rubella Not Reported	19.61	1.02
All Students	19.64	1.02

Additional Handicapping Conditions

The high rate of additional handicapping conditions resulting from maternal rubella is confirmed for the Gallaudet population, as shown in Table 4. The rubella group has an additional handicapping rate of 11.8% compared to a rate of 5.9% for the nonrubella group. In the general hearing-impaired population, these rates are approximately 34% and 25%, respectively. There is almost a doubling in the rate of visual problems and a near tenfold increase in medical problems among the rubella group. In contrast, mobility problems and cerebral palsy occur at a much lower rate. It would appear that additional handicapping conditions may affect academic progress. This would explain the lower percentages of handicapping conditions among both Gallaudet groups because those with the more severe handicapping conditions would be less likely to be eligible for postsecondary education. Those who do have additional handicapping con-

"Both the rubella-deafened group and the group who are genetically deaf show slightly higher retention rates."

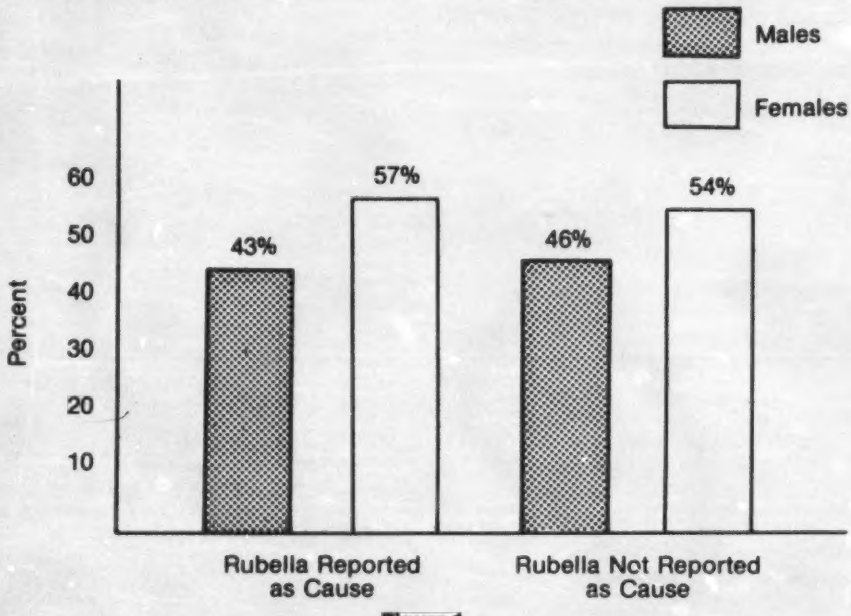

Figure 1
Distribution of Sex at Gallaudet College by Reported Cause of Deafness

Table 4
Additional Handicapping Conditions of Gallaudet College Students

Additional Handicap	Rubella Students		Nonrubella Students	
	Number Reporting Handicap	Percentage of Total	Number Reporting Handicap	Percentage of Total
Visual	3	4.4	10	2.3
Medical	4	5.9	3	.6
Mobility	0	0	2	.5
Cerebral Palsy	1	1.5	11	2.5
None	60	88.2	415	94.1

ditions and are at the college level have learned to compensate and are able to make sufficient academic progress. The key factor is most likely to be the severity of the additional handicap.

Academic Retention/Progression

Figure 2 presents overall retention rates as they relate to cause of deafness. Gallaudet College has an overall retention rate of approximately 70% for the students who were born between 1957 and 1959 and who matriculated between 1977 and 1980. Both the rubella-deafened group and the group who are genetically deaf show slightly higher retention rates. However, there is no statistically significant difference among the groups.

The grade point averages of rubella and nonrubella students and the number of credit hours they have completed are compared in Table 5. T-tests between the rubella and nonrubella groups revealed no significant difference in either of the categories.

It must be noted that some students born in 1959 have completed more credit hours than students born in either of the previous two years. One possible explanation is that many incoming students spend their first year at Gallaudet in a noncredit preparatory program. Another would be the number of students who take reduced course loads after the first two years. When both factors are taken into consideration, the result is that the students from the most recent year of birth are less likely to have their mean scores affected. The important point, however, is that there is no significant difference between rubella and nonrubella groups born in the same year.

"... it is possible to conclude that deafness due to maternal rubella does not per se adversely affect the ability to handle postsecondary programs."

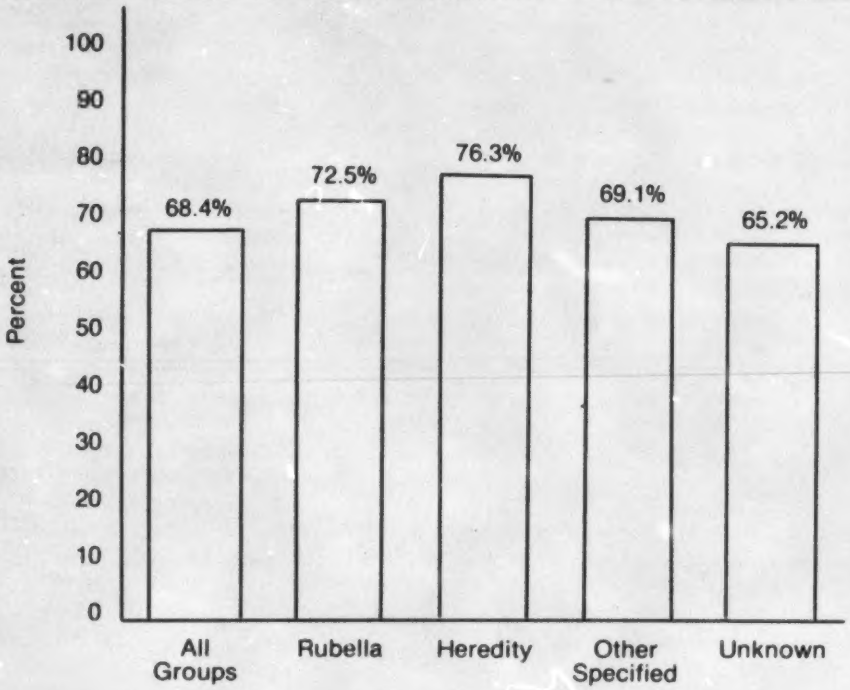

Figure 2
The Relationship of Retention Rates of Students and Cause of Deafness

Table 5

Comparison of Academic Progress between Rubella and Nonrubella Students by Year of Birth

	Rubella Reported as Cause		Rubella Not Reported as Cause	
Year of Birth	G.P.A.	Credit Hours	G.P.A.	Credit Hours
1957	2.43	47.9	2.39	50.1
1958	2.53	45.0	2.56	49.2
1959	2.59	49.0	2.49	43.0

Discussion of Results

On the basis of an examination of those hearing-impaired students born during the previous rubella epidemic, it is possible to conclude that deafness due to maternal rubella does not *per se* adversely affect the ability to handle postsecondary programs. In all likelihood, those students with more severe additional handicapping conditions have not been able to progress sufficiently through primary and secondary educational institutions to become eligible for postsecondary education.

There is every reason to suspect that a large percentage of those students born during the 1963–65 rubella epidemic will seek admission to postsecondary programs. Institutions with student special services programs will face an increase in the numbers of students to be served; those without such specialized programs will face a sudden demand for such services as interpreters, notetakers, and other kinds of support services. Perhaps the most serious implication will be the need for postsecondary institutions to be able to expand personnel, facilities, and services for the four to six years that this population will seek services on the undergraduate level without over committing its long-term resources. After considering these results, Gallaudet College has concluded that rubella-deafened students born during the 1963–65 epidemic will matriculate into postsecondary programs at approximately the same rate as other hearing-impaired students and that by 1984–85 its total enrollment will have increased by 50% over its current level. The National Technical Institute for the Deaf (NTID) projects a similar increase. The remainder of this paper will present the techniques used to

"A second important element required for a reliable enrollment forecasting process is a comprehensive database . . . ."

generate Gallaudet's projections. A final discussion will relate these projections to the likely impact of this population on higher education.

Gallaudet College Undergraduate Enrollment Forecasting Process

One of the primary and most difficult considerations an institution faces in establishing an enrollment forecasting process is the identification of the service population from which the institution is to draw its students. In this respect, Gallaudet is in a very advantageous position. The service population for undergraduate programs at Gallaudet is well-defined as the population of deaf high school graduates in the United States, particularly recent high school graduates. Once the nature of the service population is established, it is necessary to determine the rates at which students are drawn from the population. We can call these rates yield rates. When one is considering yield rates for student populations, it is essential to examine the age structures of these populations, as age is the most reliable indirect indicator of where a student will stand within an educational system at some point in the future.

A second important element required for a reliable enrollment forecasting process is a comprehensive data base describing the service population, particularly with respect to its age structure. In this respect Gallaudet is fortunate as well, since it has at its disposal the Office of Demographic Studies (ODS) surveys of the deaf population in American schools. This ODS data base provides detailed information on the ages of most students in American primary and secondary educational institutions.

In order to forecast enrollment, it is necessary to have historical information concerning the rates at which new students have enrolled from the general population. As mentioned before, the critical variable here is the age structure of the new student population. Examination of the group of new students entering Gallaudet in the fall of 1980 reveals the age structure presented in Table 6.

The median age of new students in the fall of 1980 was, as it has been for many years, 19 years old. In order to simulate the enrollment at Gallaudet as segments of the deaf population, it is possible to calculate yield rates from that population according to various assumptions. We could, for instance, calculate yield rates for new students for each age represented in the new student population; however, this would be an excessively complicated procedure as some 22 different ages (16–59) are represented in this group. Since 19 is the median age for new students, the simplest alternative would be to make the arbitrary assumption that all new students are derived from the 19-year-old secondary school student population. For producing projections, this is an alternative which would appear to work well unless there is wide variation from year to year in the numbers of deaf children born. This latter situation is exactly what confronts Gallaudet with the coming of age of the children born during the rubella epidemic of 1964–65. The consequences, in enrollment projections, of employing this alternative are described below. Another alternative involves simplifying the age structure of the new student group to include the three most numerous age groups about the median—namely 18, 19, and 20 year olds. The consequences of selecting this alternative will also be described below.

Table 6

Age Structure of New Gallaudet Students Fall 1980

Age	Percentage of New Students
< 18	5
18	20
19	29
20	18
> 20	28

The next step in producing enrollment projections, once the numbers of new students have been estimated, is to simulate the passage of these students through the institution by class. Class progression ratios can be calculated as retention ratios, namely, as the ratio of the current year's class of, for instance, sophomores over the preceding year's class of freshmen. This process will be described more fully in the sections which follow. The following sections will describe two separate enrollment projection series for Gallaudet and the methods used to derive them.

Series 1: New Students Projected from 19-Year-Old Deaf Population

If the unrealistic, but convenient, assumption is made that all new students are derived from the general population of 19-year-old deaf students in the country, then the yield rates shown in Table 7 can be calculated.

The mean yield rate for this seven-year period is .091% and the distribution of yield ratios has no discernible trend. In order to project

"During the last seven years, an average of 65% of the new students have entered as preps and 35% have entered as freshmen."

Table 7

Yield Rates of New Gallaudet Students as a Proportion of the 19-Year-Old Deaf Population

Academic Year	Number of New Students	Number of Deaf 19 Year Olds	Yield Rate
1974–75	294	2,650	.111
1975–76	251	2,778	.090
1976–77	299	2,956	.101
1977–78	354	4,374	.081
1978–79	336	4,144	.081
1979–80	282	3,563	.079
1980–81	297	3,275	.091

Note. These are data from the 1980 ODS survey inflated by 25% to compensate for underreporting. They differ from values presented in Table 1 because they are so inflated and because they represent a more recent and more complete census.

the number of new students at Gallaudet in years to come, we can apply this mean yield rate to the expected number of people who will be 19 years old during the next ten years. The mean value is used here because it is assumed that there is no trend in the yield rates during the seven-year period considered here. Note also that the yield rate results from a number of actions taken by potential students, including application, admission, and, finally, enrollment. This process has a funneling or narrowing effect. To illustrate, typically the number of applications received for an academic year as a proportion of the 19-year-old population equals 30%. Of these, 51% are accepted, and of these admitted students, 58% eventually enroll; if we take the product of these last three proportions, we get back the 9% yield rate originally mentioned. It is important to note that there are no significant trends in these proportions, with the exception that the acceptance rate has declined slightly while the application rate has increased. In sum, it is concluded that it is appropriate to use the mean of the yield rate in order to project numbers of new students.

Table 8 presents the 1980 ODS projections for 19-year-old deaf students, as well as the projected numbers of new Gallaudet students according to the method just described.

New undergraduate students at Gallaudet can enroll either as preparatory (i.e., developmental) students or as freshmen. During the last seven years, an average of 65% of the new students have entered as preps and 35% have entered as freshmen. The new students are projected to enter, then, in the frequencies by classification which are displayed in Table 9.

The numbers of students projected in this way comprise the entire preparatory class for each year. However, new students make up only about 30% of the freshman class. The remainder of the freshman class can be simulated by deriving it from the preceding year's freshmen

Table 8

Projected Numbers of Gallaudet Students from the 19-Year-Old Population

Academic Year	19-Year-Old Population	Yield Rate	New Students (Fall Semester)
1981–82	3,455	.091	314
1982–83	3,744	.091	341
1983–84	9,488	.091	863
1984–85	6,498	.091	591
1985–86	4,209	.091	383
1986–87	3,961	.091	360
1987–88	4,016	.091	365
1988–89	4,008	.091	365
1989–90	3,696	.091	336

"One other component . . . is the number of special or nondegree students who enroll at Gallaudet."

Table 9

Projections for Class Level of Entering Students

	Fall Semester	
Academic Year	Preps	Freshmen
1981–82	204	110
1982–83	222	119
1983–84	561	302
1984–85	384	207
1985–86	249	134
1986–87	234	126
1987–88	237	128
1988–89	237	128
1989–90	218	118

and preparatory students. The model that is used here contains the (incorrect but useful) assumption that all of the preparatory students move forward into the next year's freshman class and that the remainder of the freshmen are derived as a proportion of the previous year's freshman class. In this case, the latter proportion is equal to .182. The freshman class, then, has three components: new students, preparatory students from the previous year, and freshmen from the previous year.

All of the upper classes are derived as proportions of the immediately lower class from the preceding year through the application of transition probabilities to the number in that year's class. For example, the six-year average for the transition probability between freshman and sophomore year is .459. That is, the number of sophomores in year $t+1$ can be projected as approximately 46% of the freshmen in year t. The average probability for the transition from sophomore to junior year is 1.151, accounting for the return of students who have left for some period of time and for upper class transfers. The final probability of attaining senior status is .875. Thus, the projections for all of the upper classes are derived from the projection for freshmen at some time in the past. The projection for seniors in year t is ultimately derived from the projection for freshmen in year t-3; that for juniors in year t is from freshmen in year t-2; and for sophomores from freshmen in year t-1. Table 10 illustrates this principle.

One other component of the undergraduate enrollment is the number of *special* or nondegree students who enroll at Gallaudet. Historically, this number has averaged about 50 students and will be assumed to continue to do so except during the *rubella years*, when it will be projected to double.

In order to test the "goodness of fit" of this model, levels of total enrollment have been "retrofitted" from ODS data for six previous years and compared to the actual enroll-

Table 10

Class Transitions of a Hypothetical Freshman Class

Year	Freshmen	Sophomores	Juniors	Seniors
t	x			
t + 1	y	(.459)x		
t + 2	z	(.459)y	(1.151)(.459)x	
t + 3		(.459)z	(1.151)(.459)y	(.875)(1.151)(.459)x

Table 11

Comparison of Actual to Fitted Enrollment Levels

Fall Semester	Actual	Fitted	Percentage Difference
1975	1,006	1,032	+ 2.6
1976	1,027	1,014	− 1.3
1977	1,157	1,154	− .3
1978	1,223	1,258	+ 2.9
1979	1,202	1,260	+ 4.8
1980	1,224	1,256	+ 2.6
	Mean Absolute Percent Deviation		2.4

"The peak enrollment continues to arrive in Fall 1984 . . . ."

Table 12

Series I: Number of New Gallaudet Students Projected from 19-Year-Old Population

Fall Semester	PR	SP	FR	SO	JU	SE	Total
1974	210	37	299	146	183	148	1,023
1975	173	30	317	160	164	162	1,006
1976	188	66	306	160	175	132	1,027
1977	246	64	376	145	171	155	1,157
1978	204	53	492	142	175	157	1,223
1979	195	53	403	205	188	158	1,202
1980	209	56	396	179	224	160	1,224
			PROJECTED				
1981	204	50	391	182	206	196	1,229
1982	222	50	394	179	209	180	1,234
1983	561	100	596	181	207	183	1,828
1984	384	100	876	274	208	181	2,023
1985	249	100	648	402	315	182	1,896
1986	234	100	493	297	463	276	1,863
1987	237	50	452	226	342	405	1,712
1988	237	50	447	207	260	300	1,501
1989	218	50	436	205	239	228	1,376

Note. PR = Preparatory FR = Freshman SO = Sophomore
SP = Special JU = Junior SE = Senior

ment levels for those years. Table 11 displays a summary of the results of fitting these values to the historical data.

The fit is quite good as Table 11 reveals, the mean absolute percent deviation of the actual from the fitted values being 2.4%. When this full model is applied to the ODS projections for the 19-year-old population, it results in the projections displayed in Table 12.

Series II: New Students Projected from 18, 19, and 20-Year-Old Deaf Population

Series II is based upon assumptions similar to those made in Series I with the exception that it is assumed that new students are derived from the population of 18, 19, and 20-year-old deaf individuals. The age breakdown of the new student group at Gallaudet in the fall of 1980 was presented in Table 6. For purposes of modeling enrollment, somewhat arbitrary proportions will be assumed to hold for the 18, 19, and 20-year-old group among the new students: .25, .50, and .25, respectively. Although not precisely simulating the actual age distribution for new students, this set of assumptions has the advantage of accentuating the importance of the median group, those who are 19 years old. When these ratios (.25, .50, .25) are applied to the actual numbers of new students during the past seven years, the estimated yield rates for new students can be derived from the ODS data for population levels of 18, 19, and 20-year-old deaf individuals (Table 13).

Applying these mean estimated yield rates to the ODS population data for the 18, 19, and 20-year-old groups, we obtain the projections for numbers of new students contained in Table 14.

Once the total numbers of new students are projected, enrollments by class are projected according to the same methods described for Series I. These projected values are presented in Table 15. It should be noted that when enrollment levels are "retrofitted" by this method to the historical period Fall 1975–Fall 1980, a mean absolute percent deviation of 2.1% is produced, superior to the 2.4% of Series I. Note also that the enrollment projections in Series II more closely simulate the actual Gallaudet experience than does Series I, and that the projection series derived according to this second method tends to flatten the *rubella bulge* and suggests that it will begin in 1982–83 rather than 1983–84 (Figure 3). The peak enrollment continues to arrive in Fall 1984, but at a slightly lower level (1,945 as opposed to 2,023).

"... the enrollment growth expected at Gallaudet will be typical of the general growth in four-year programs for the hearing impaired."

Overview of the Enrollment Forecasting Process

It is important at this point to consider several possible weaknesses in the forecasting process used here. This process involves simple projections of current experience into the future and falls into a category which has been called "trend-demographic" (Dresch, 1975, 1978). This type of process has several major weaknesses, the most important of which is the underlying assumption that conditions which cause students to enroll at present will not change in the future (Armstrong & Nunley, 1981). This is probably a poor assumption, especially since the College faces such rapid expansion in its population base. For instance, Gallaudet College traditionally has provided on-campus housing for virtually all students who requested it, but it is possible that the College will not be able to continue this practice during the rubella period. Changing factors such as this could be expected to affect the yield rates which were discussed above, thereby lowering the actual enrollment below the expected level. On the other hand, if other postsecondary programs for the deaf are not able to expand during the rubella years, we might expect the yield rates at Gallaudet to increase. It is important, therefore, to realize that these projections are likely to be less than perfect, and they will require close monitoring during the next several years. However, it is possible to conclude that the enrollment growth expected at Gallaudet will be typical of the general growth in four-year programs for the hearing impaired.

Table 13

Estimated Yield Rates for New Students from Population by Age

Fall Semester	18-Year-Old New Students	Yield Rate from Pop.	19-Year-Old New Students	Yield Rate from Pop.	20-Year-Old New Students	Yield Rate from Pop.	Total
1974	74	.027	146	.055	74	.028	294
1975	63	.021	125	.045	63	.024	251
1976	75	.017	150	.051	75	.027	299
1977	88	.021	178	.041	88	.030	354
1978	84	.024	168	.041	84	.019	336
1979	71	.022	140	.039	71	.017	282
1980	74	.021	149	.045	74	.021	297

Note. Mean Yield Rate for 18 Year Olds = .022
Mean Yield Rate for 19 Year Olds = .045
Mean Yield Rate for 20 Year Olds = .024

Table 14

Projected Numbers of New Students from 18, 19, and 20-Year-Old Deaf Population

Fall Semester	18-Year-Old Students	19-Year-Old Students	20-Year-Old Students	Total
1981	82	155	79	316
1982	209	168	83	460
1983	143	427	90	660
1984	93	292	228	613
1985	87	189	156	432
1986	88	178	101	367
1987	88	181	95	364
1988	81	180	96	357
1989	79	166	96	341

Impact on Higher Education

The important point to consider here is that Gallaudet projections should be fairly typical of the situation facing baccalaureate-level institutions which have substantial enrollments of hearing-impaired students. The enrollment in the peak year will be approximately 50–60% higher than its current level. The situation in two-year colleges will be

"... the 12,000 hearing-impaired students enrolled in postsecondary programs in 1978 will increase by 75% to 21,000 in 1984."

Table 15

Series II: Number of New Gallaudet Students Projected from 18, 19, and 20-Year-Old Population

Fall Semester	PR	SP	FR	SO	JU	SE	Total
1974	210	37	299	146	183	148	1,023
1975	173	30	317	160	164	162	1,006
1976	188	66	306	160	175	132	1,027
1977	246	64	376	145	171	155	1,157
1978	204	53	492	142	175	157	1,223
1979	195	53	403	205	188	158	1,202
1980	209	56	396	179	224	160	1,224
			PROJECTED				
1981	205	50	392	182	206	196	1,231
1982	299	50	437	180	209	180	1,355
1983	429	100	609	201	207	183	1,729
1984	398	100	755	280	231	181	1,945
1985	281	100	686	347	322	202	1,938
1986	239	100	534	315	399	282	1,869
1987	237	50	452	226	362	405	1,712
1988	232	50	446	212	282	317	1,539
1989	222	50	432	205	243	247	1,399

Note. PR = Preparatory FR = Freshman SO = Sophomore
SP = Special JU = Junior SE = Senior

more dramatic, but not as long-lived. The peak of enrollment in these institutions could be expected to be twice what it currently is during a two to three-year period beginning in the fall of 1983. We foresee a scenario in which the 12,000 hearing-impaired students enrolled in all postsecondary programs in 1978 will increase by 75% to 21,000 in 1984.

Anecdotal evidence suggests that such increases in enrollment may have serious impacts upon the ability of local colleges and universities to provide services. These enrollment increases could be even greater if there is persistence in current trends toward greater participation rates by hearing-impaired students. It is also possible that federal budgets for the two major postsecondary programs for the deaf, Gallaudet and the National Technical Institute for the Deaf, may be restricted to current levels. This would place an even greater burden upon the local programs, and costs for these programs are already great, requiring, as they do, interpreter services. We have an estimate from a Washington, D.C., area community college that interpreter services currently cost approximately $1,000 per deaf student per year. For 21,000 students in 1984 this would mean that the higher education establishment would need to find $21,000,000[1] in current monies.

The longer range needs of these individuals, as they enter the adult population, need to be addressed as well. Figure 4 presents a graphic display of increases in the 18–25-year-old deaf population during the coming decade. As was mentioned earlier, as with the general population, deaf students are tending to enter college at ages in excess of the typical college age. This means that the problem of higher numbers of deaf people attempting to enroll in higher education institutions will probably persist into the 1990s.

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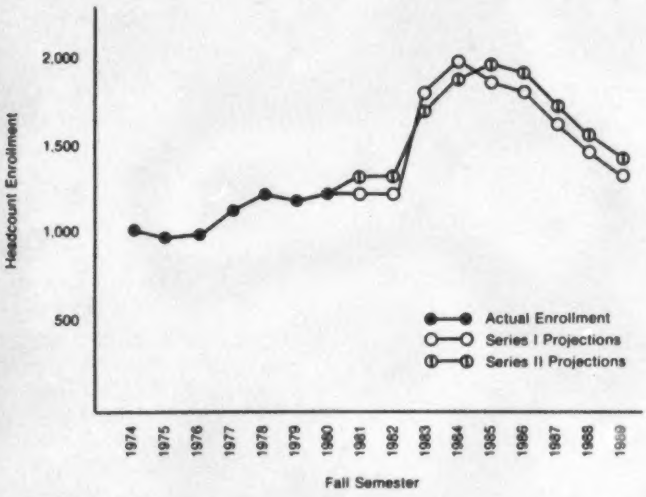
1. This estimate is undoubtedly quite low, as it refers to an institution at which the majority of students attend part-time. The real cost is likely to be at least twice this amount.



Note: These projections are not the official projections of Gallaudet College. They represent the numbers of students that the College could expect to enroll if all conditions remain the same. Given budgetary or physical constraints, the College might have to adopt considerably different enrollment levels.

Figure 3
Gallaudet College Enrollment Projections

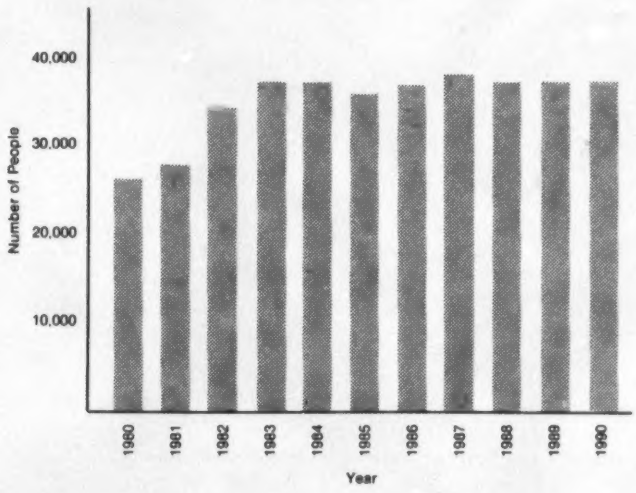


Figure 4
Increase in Population of 18–25-Year-Old Deaf People in the U.S. 1980–1990

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